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# Some Issues in the National Income Accounts of Pakistan (Rebasing, Quarterly and Provincial Accounts and Growth Accounting)

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PhD Dissertation

# SOME ISSUES IN THE NATIONAL INCOME ACCOUNTS OF PAKISTAN

**(Rebasing, Quarterly and Provincial Accounts and Growth Accounting)**

**Muhammad Farooq Arby**

Reg. # 130/2000

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Submitted in partial fulfillment of the degree of Doctor of Philosophy in Economics

**Pakistan Institute of Development Economics**

Islamabad, Pakistan

February 2008

## CERTIFICATE

This is to certify that the thesis entitled "Some Issues in the National Income Accounts of Pakistan (Rebasing, Quarterly and Provincial Accounts and Growth Accounting)" submitted by Mr. Muhammad Farooq Arby is accepted in its present form by the Department of Economics, Pakistan Institute of Development Economics, Islamabad as satisfying the requirements for partial fulfilment of the degree of Doctor of Philosophy in Economics.

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To *Bhai Jan* Dr. Muhammad Khalid Arby who has been the continuous source of inspiration for me since my very first day at school

# Some Issues in the National Income Accounts of Pakistan

## (Rebasing, Quarterly and Provincial Accounts and Growth Accounting)

**CONTENTS**

# Preface

As a student of economics, I have a proclivity for exploring the underlying data generating processes of economic variables and it was by coincidence that I selected a topic of my taste for a PhD dissertation. My original proposal for the dissertation was related to Pakistan's experience of economic growth and capital flows. I had a plan to investigate empirically the relationship between growth and capital flows by using cointegration and error correction techniques; for this purpose I needed quarterly data to have a sufficiently large sample size. Although the data of capital flows were available on quarterly basis, the GDP was not. My supervisor Dr. A. R. Kemal suggested to estimating quarterly series of GDP as a separate exercise which could be used not only in my work but also would be available to other researchers. We estimated the quarterly GDP at constant prices of 1980-81 that was published in the form of a statistical paper by Pakistan Institute of Development Economics. Soon after our work, the Federal Bureau of Statistics (FBS) released new series of national accounts at new base year prices of 1999-00 for a period from 1999-00 to 2003-04. The rebasing of national accounts brought up new issues including converting the past series at new base year prices and re-estimating the quarterly series of GDP. Since during our earlier work on quarterly GDP I had gained some understanding of the estimation techniques of national accounts, I was naturally inclined to take such issues up and to do further research on national accounts of Pakistan. Thus, with the encouragement by Kemal Sahib, I changed my mind, gave up the earlier proposal and started thinking on national accounts issues for the purpose of my PhD dissertation.

Three major issues were identified which included re-estimating the past series of national accounts according to the new methodology and its re-basing from 1980-81 to 1999-00, quarterizing the new series, and estimating provincial accounts of national income. My co-supervisor Dr. Musleh-ud-Din was of the view that there should also be a section on the application of the new series of gross domestic product. It was suggested that total factor productivity may be worked out on the basis of the new estimates of GDP and its sub-sectors through growth accounting framework. Thus a detailed exercise on estimating capital stock and total factor productivity was included as a part of the dissertation.

The most difficult part of this project was to collect raw data for past thirty years relating to different economic activities at national and provincial levels. In pursuit of data, I had to visit a number of libraries and institutions like Pakistan Post Office, Oil and Gas Development Authority, Civil Aviation, Federal Bureau of Statistics, Pakistan Agriculture Research Council, Central Board of Revenue, Public Administration Research Centre, etc. Contrary to my fears, I was usually provided with welcome support by different institutions. However, very disappointing aspect has been the conditions of libraries I visited; lack of systematic record and missing publications are serious hurdles in the work of researchers.

The present dissertation is a blend of economics and statistical techniques. I have tried to make a systematic exposition of the concepts and techniques of compiling national accounts along with the issues I have taken up in the dissertation. I hope it will not only earn a PhD degree for me but also help the general readers in understanding the underlying data generation processes of economic variables and provide the researchers with consistent series of some of the key macro-aggregates for a sufficiently long period.

# Acknowledgment

I am highly indebted to my thesis supervisor Dr. A. R. Kemal who has motivated me to embark upon this project and very generously bestowed me from his very long experience and deep understanding of the issues in national income accounts of Pakistan. I also wish to express highest gratitude to my co-supervisor, Dr. Musleh-ud-Din, for his encouragement on the one hand and critically examining my work on the other. Ishaq Rana at FBS has greatly helped me in understanding the techniques of compiling national accounts; his assistance is acknowledged gratefully. Two external referees of this dissertation deserve special gratitude for their very encouraging comments on my work and some useful suggestions. I would also appreciate the valuable assistance provided by Naqvi of PIDE library and Bashir Zia of SBP library during my search for old publications relating to the topic of my dissertation.

I owe special debt to Dr. Ishrat Husain, ex-governor of State Bank of Pakistan for providing me with an opportunity to do PhD by launching a very useful scheme of study leave for SBP employees. The members of the SBP Committee for PhD scholarship, Mushtaq A. Khan, Abdul Nasir, Mr. Riaz Riazuddin and Aftab Nadeem also deserve my special thanks for approving my name for the award of this scholarship.

Grateful appreciation is extended to all my colleagues at Pakistan Institute of Development Economics, and especially to Tahir Mahmood and Nadeem Hanif, whose genial company during the course of my studies bears long-lasting memories.

It is my pleasure to express my gratitude to my wife Mrs. Haleema Saadia and our children Zarnab, Omar, Ibrahim and Areeb, who supported me continuously by never complaining for my heedlessness towards them; instead they always applauded my efforts. I am also obliged to my parents; it is due to their blessings that I was able to complete this arduous work.

Having acknowledged the support tendered by the above mentioned persons, I would like to state that for any error found in the dissertation, only I am the responsible.

# Executive Summary

This dissertation takes on some important issues related with national accounts of Pakistan including (a) re-estimation of past series of national accounts (prior to the year 1999-00) to make it consistent with the new official series for years 1999-00 onward at new base year prices; (b) quarterisation of annual series of national accounts to remove one of the major stumbling block in research by making available high frequency data, (c) estimation of provincial accounts with new base year prices, and (d) estimation the contribution of total factor productivity (TFP) to economic growth with the new series of gross domestic product and its sub-sectors.

Thus by embarking upon the above mentioned issues, the dissertation contributes to the economic literature in the following respects:

i) It provides a new set of national accounts at 1999-00 prices as well as at current prices for a period from 1970-71 to date consistent with the new official estimates for recent years.

ii) It gives quarterly data of GDP and all its sectors/sub-sectors both at constant prices of 1999-00 and at current prices.[1] A by-product of this exercise is quarterly GDP deflator (with 1999-00=100) which was earlier not available in Pakistan.

iii) It presents estimates of provincial GDP and all its sectors/sub-sectors covering all the provinces in a consistent framework.[2]

iv) It provides series of gross fixed capital formation and capital stock estimated at disaggregated level and at prices of 1999-00.

v) It estimates contribution of TFP, capital and labour to the growth of GDP and its sectors/sub-sectors (growth rates of new series at 1999-00 prices).

In its attempt to re-estimate the previous series at new base of 1999-00, the dissertation followed, to the extent possible, the same methodology as of the Federal

[1] Earlier work on quarterisation include Bengaliwala (1995) and Kemal and Arby (2004), however, both are at old base year prices of 1980-81 and available only at constant prices.
[2] Earlier work on provincialisation is Bengaliwala (1995) and Bengali and Sadaqat (2005), however, both are old base year prices of 1980-81.

Bureau of Statistics (FBS). Rather, it has improved upon FBS methodology in case of some sub-sectors including livestock and slaughtering by re-estimating population of different animals and the number of animals slaughtered with more logical techniques (detail discussion in chapter 4).

For quarterization of national accounts, maximum information available in official sources or in different studies have been used which include: harvest calendars of all major crops and most of the minor crops (with province level detail); seasonal patterns of milk production, fish catch, and timber; quarterly production of different minerals, manufacturing goods, and cement (for construction activities); seasonal pattern of utilities consumption; quarterly imports and financial indicators like M2; etc. Moreover, mechanical technique of quarterisation as proposed by Lisman and Sandee (1964) has also been used in case of some sub-sectors like Transport, storage & communication, ownership of dwellings and other services.

The provincial distribution of national accounts have been done by using some related indicators; however, provincial value added for sectors like crops, fishing, and mining & quarrying have been estimated directly by product approach just like national accounts.

In order to estimate the contribution of total factor productivity to growth, the dissertation has undertaken a detailed exercise of estimating the capital stock at constant prices of 1999-00 and skill-adjusted labour force – both the inputs for all sub-sectors of GDP. The non-parametric approach as suggested by Solow has been used in factorization of overall GDP growth as well as growth in all sub-sectors.

The results show that the series of national accounts estimated by this dissertation are fairly close to the official series for years 1999-00 to 2004-05, which gives a confidence to estimates of this dissertation for series prior to 1999-00.

It has been found that on average 21.8 percent of the annual GDP is produced in the first quarter (Jul-Sep) followed by the third quarter (Jan-Mar) with 25.2 percent of annual GDP. In the second quarter (Oct-Dec) the production of goods and services is

the highest at 26.9 percent. In the last quarter (Apr-Jun) production is also high with 26.1 percent of the annual.

The provincial distribution of gross domestic product shows that the Punjab holds the highest share in gross domestic product (52.3 percent); it is followed by Sindh (30.6 percent), NWFP (11.5 percent) and Balochistan (5.5 percent). However, over the years the Punjab's share has declined: during 1970s, about 54 percent of the country's GDP was being generated in the Punjab that declined to 51.8 percent in 2000s. On the other hand, shares of NWFP and Balochistan in total GDP have increased during this period; there is no significant change in the share of Sindh in total GDP during the period of 1970-2005.

The results of growth accounting exercise shows that average contribution of total factor productivity to GDP growth during the period 1970-2005 had been 1 percentage point. It was higher in 1970s and early eighties and remained below 1 percent in subsequent years with negative growth during the periods of late 1980s and late 1990s. However, resurgence in total factor productivity growth has been witnessed in recent years. Comparing the relative contribution of capital and labour, the results show that labour remained the biggest contributor to economic growth during 1970-2005; however, in recent years, capital contribution has surpassed the labour contribution.

# پاکستان کی قومی آمدنی کے حسابات کے چند مسائل

## (سالِ حوالہ کی تبدیلی، سہ ماہی اور صوبائی حسابات، اور شرحِ نمو کا تجزیہ)

محمد فاروق عارفی

یہ مقالہ پاکستان کے قومی حسابات سے متعلق چند اہم مسائل پر بحث کرتا ہے جو یہ ہیں: (ا) 00-1999ء سے پہلے کے قومی آمدنی کے اعداد و شمار کا نو تخمینہ تا کہ سالِ حوالہ کی تبدیلی کے بعد جاری کیے جانے والے سرکاری اعداد و شمار سے ان کی مطابقت پیدا کی جائے، (ب) قومی آمدنی کے سہ ماہی اعداد و شمار وضع کرنا تا کہ معاشی تحقیق میں پیش آنے والی ایک بڑی رکاوٹ دور ہو سکے، (ج) صوبائی آمدنی کے حسابات کا تخمینہ، اور (د) خام ملکی پیداوار اور اس کے ذیلی شعبوں کے نئے اعداد و شمار کی بنیاد پر معاشی شرح نمو کا تجزیہ اور اس میں عاملین کی اجتماعی پیداواریت (TFP) کے کردار کا جائزہ۔

چنانچہ مذکورہ بالا امور کا احاطہ کرتے ہوئے یہ مقالہ علمِ معاشیات میں درج ذیل حوالوں سے اضافہ کرتا ہے:

(ا) یہ 71-1970ء سے لے کر آج تک کے لئے قومی آمدنی کے نئے تخمینے پیش کرتا ہے جو 00-1999ء کی مستقل قیمتوں اور جاری قیمتوں دونوں کے لحاظ سے مرتب کیے گئے ہیں، اور حالیہ برسوں کے نئے سرکاری تخمینوں سے مطابقت رکھتے ہیں۔

(ب) یہ خام ملکی پیداوار اور اس کے تمام شعبوں/ ذیلی شعبوں کے سہ ماہی اعداد و شمار 00-1999ء کی مستقل قیمتوں اور جاری قیمتوں دونوں کے لحاظ سے پیش کرتا ہے۔ اس کا ایک ضمنی فائدہ ملکی پیداوار کی بنیاد پر بنایا جانے والا قیمتوں کا سہ ماہی اشاریہ (GDP deflator) ہے جو اس سے قبل پاکستان میں دستیاب نہ تھا۔

(ج) یہ مقالہ خام صوبائی پیداوار اور اس کے تمام شعبوں/ ذیلی شعبوں کا تخمینہ پیش کرتا ہے۔
(د) یہ خام معینہ سرمایہ سازی اور مختلف شعبوں میں کارفرما سرمایے کی کل مقدار کا تخمینہ بھی پیش کرتا ہے۔
(ھ) یہ مجموعی معاشی شرح نمو اور معیشت کے ذیلی شعبوں کی نمو میں اجتماعی پیداواریت، سرمائے اور محنت کے کردار کا تجزیہ کرتا ہے۔

اس مقالے میں نئے سالِ حوالہ کی بنیاد پر مرتب کیے جانے اعداد و شمار کے لئے وفاقی ادارہ شماریات کے طریقہ کار کو ممکنہ حد تک اختیار کیا گیا ہے۔ بلکہ بعض صورتوں میں وفاقی ادارہ شماریات سے بہتر طریقہ کار اختیار کیا گیا ہے، جیسے گلہ بانی اور ذبیحہ کے شعبوں کے لیے جانوروں کی تعداد اور ذبح شدہ جانوروں کی تعداد کا از سرِ نو اور زیادہ منطقی انداز میں تخمینہ لگایا گیا ہے (تفصیلی بحث باب 4 میں ہے)۔

سہ ماہی قومی حسابات کے لیے سرکاری اور دیگر ذرائع میں دستیاب زیادہ سے زیادہ معلومات کو استعمال کیا گیا ہے جن میں یہ باتیں شامل ہیں: تمام بڑی فصلوں اور اکثر چھوٹی فصلوں کی کٹائی کے موسموں کی (صوبائی سطح کی) تفصیلات، مختلف مہینوں میں دودھ کی پیداوار، مچھلیاں پکڑنے اور لکڑی کے حصول کے موسمیاتی انداز، معدنیات کی سہ ماہی پیداوار، مصنوعات کی تیاری، سیمنٹ کی پیداوار (تعمیراتی سرگرمیوں کے لیے) اور اشیائے صرف کے استعمال کے موسمیاتی انداز، سہ ماہی درآمدات اور زرِ وسیع جیسے مالی اظہاریے وغیرہ۔ مزید برآں بعض ذیلی شعبوں مثلاً ٹرانسپورٹ، ذخیرہ کاری اور نقل و حمل، مکانات اور دیگر خدمات کے سہ ماہی تخمینوں کے لیے لزمین اور سیندی (1964ء) کا تجویز کردہ میکانیاتی طریقہ اپنایا گیا ہے۔

قومی حسابات کی صوبائی تقسیم کے لیے بعض متعلق اظہاریے استعمال کیے گئے، تاہم فصلوں، ماہی گیری، اور کان کنی اور معدنیات جیسے شعبوں کے صوبائی اضافۂ قدر کا تخمینہ اسی طریقے سے کیا گیا ہے جس طریقے سے قومی حسابات کا تخمینہ کیا گیا۔

نمو میں اجتماعی پیداواریت کے کردار کو جاننے کی غرض سے اس مقالے میں ایک تفصیلی مشق کی گئی ہے جس میں

1999-00ء کی مستقل قیمتوں پر سرمایے کی مقدار اور مزدوروں کی تعداد (مہارت کو ملحوظِ خاطر رکھتے ہوئے) کا تخمینہ لگایا گیا ہے۔ حقیقی نمو کے مفصل تجزیے کے لیے سولو کا تجویز کردہ طریقہ استعمال کیا گیا ہے۔

نتائج سے معلوم ہوتا ہے کہ اس مقالے میں مرتب کیے گئے قومی آمدنی کے اعداد و شمار حالیہ برسوں کے لیے دستیاب سرکاری اعداد و شمار سے خاصی مماثلت رکھتے ہیں، جس کے سبب یہ اعتماد پیدا ہوا کہ 1999-00ء سے قبل کے اعداد و شمار کے حوالے سے بھی اس مقالے کے تخمینے درست ہوں گے۔

یہ بات معلوم کی گئی ہے کہ سالانہ خام ملکی پیداوار کا اوسطاً 21.8 فیصد پہلی سہ ماہی (جولائی تا ستمبر) میں اور 25.2 فیصد تیسری سہ ماہی (جنوری تا مارچ) میں پیدا ہوتا ہے۔ دوسری سہ ماہی (اکتوبر تا دسمبر) میں اشیا اور خدمات کی پیداوار بلند ترین سطح 26.9 فیصد پر ہوتی ہے۔ آخری سہ ماہی (اپریل تا جون) میں بھی پیداوار زیادہ ہوتی ہے جو 26.1 فیصد کے مساوی ہے۔

خام ملکی پیداوار کی صوبائی تقسیم سے ظاہر ہوتا ہے کہ اس میں پنجاب کا حصہ سب سے زیادہ (52.3 فیصد) ہے۔ اس کے بعد سندھ (30.6 فیصد)، صوبہ سرحد (11.5 فیصد) اور صوبہ بلوچستان (5.5 فیصد) کا نمبر ہے۔ تاہم وقت کے ساتھ ساتھ پنجاب کا حصہ کم ہوا ہے: 1970ء کی دہائی میں ملک کی کل پیداوار کا تقریباً 54 فیصد پنجاب میں پیدا ہوتا تھا جو کہ 2000ء کی دہائی میں گر کر 51.8 فیصد رہ گیا۔ دوسری طرف اس عرصے کے دوران خام ملکی پیداوار میں صوبہ سرحد اور بلوچستان کے حصوں میں اضافہ ہوا ہے۔ تاہم سندھ کے حصے میں 1970ء تا 2005ء عرصے کے دوران کوئی نمایاں تبدیلی واقع نہیں ہوئی۔

نمو کے تجزیہ سے پتہ چلتا ہے کہ 1970ء تا 2005ء عرصے کے دوران معاشی شرح نمو میں اجتماعی پیداواریت کا اوسط حصہ ایک فیصدی درجے رہا۔ 1970ء کی دہائی اور 1980ء کی دہائی کے اوائل میں یہ نسبتاً بلند تھا اور بعد کے برسوں میں ایک فیصد سے کم رہا جبکہ 1980ء کی دہائی کے اواخر اور 1990ء کی دہائی کے اواخر میں اس کی نمو منفی رہی۔ تاہم اجتماعی پیداواریت کی نمو میں حالیہ برسوں کے دوران دوبارہ

اضافہ دیکھنے میں آ رہا ہے۔ سرمائے اور محنت کے متعلقہ حصے کا موازنہ کرنے سے معلوم ہوتا ہے کہ 1970ء تا 2005ء عرصے کے دوران اقتصادی نمو میں محنت نے سب سے بڑا کردار ادا کیا، تاہم حالیہ برسوں میں سرمائے کا حصہ محنت کے حصے سے آگے نکل چکا ہے۔

☆☆☆

# 1 Introduction

## 1.1 Introduction

The national accounts constitute the most important source of information about the state and performance of the economy, in the same way as the operating and financial accounts of an individual firm convey information about the condition of that firm. They refer to a well defined set of aggregates measuring various aspects of economic activities, including production, consumption, investment, exports, imports, etc. The importance of reliable estimates of these aggregates cannot be overemphasized for the purpose of economic policy making. The indicators of economic performance like GDP growth, per capita income, index of productivity, etc., can only be computed when estimates of national income accounts (NIA) are available; and also the quality of such indicators depends on the quality of NIA. This is why every country prepares such accounts regularly, and in doing so tries to follow some standards to ensure quality and credibility of the accounts. In Pakistan, like many other countries of the world, the national accounts are prepared in accordance with the *System of National Accounts* (SNA), a framework devised by the United Nations and consisting of coherent and integrated accounts with internationally agreed definitions and rules.[1] Federal Bureau of Statistics (FBS) is the authority which prepares these accounts of Pakistan on annual basis.

Recently Federal Bureau of Statistics has brought major changes in the national income accounting which include changes in the price and quantity measurements of almost all the sub-sectors of the gross domestic product and investment accounts, and rebasing of the accounts from 1980-81 to 1999-00 (FBS, 2004). It has published new estimates of national income from 1999-00 onward. Since the changes are very significant, the past series of national income accounts which are based on 1980-81 prices have become inconsistent with the new series.[2] Thus the revision of base and

[1] There are three versions of the system of national accounts devised by UN so far: The SNA 1953, 1968 and 1993.

[2] The new estimate of nominal GDP for 1999-00 is Rs 3562 billion which is 21% higher than old estimates. The new estimate of real GDP for 1999-00, on the other hand, is 455% higher than the old one. Similar is the case with different sub-sectors of the GDP.

methodology, though highly desirable, has impeded the work of researchers who need a sufficiently long and consistent series of data for doing some meaningful analysis. Moreover, evaluation of the economic policies at different time periods also becomes difficult and so is the research based policies formulation if the consistent data set is not available.

Generally a series with two different base years is adjusted by using splicing technique which essentially assumes that the growth rates of the series remain unchanged with the change of the base. However, in the present case of national accounts of Pakistan, splicing will give highly misleading results because the gap between the two base years is very large; over this period of two decades, both the quantity weights and relative prices of the commodities have changed significantly.[3] The growth rates of various aggregates of national accounts evaluated at 1999-00 prices cannot remain the same as of the same evaluated at 1980-81 prices due to significant changes in relative prices.[4] Moreover, a number of new commodities have appeared in the markets like mobile phone and courier services, and a number of others have become obsolete. Thus the adjustment of the past data according to the new methodology and base needs a careful and detailed work.

In addition to the above mentioned methodological issues, there are also two other longstanding issues related with national income accounts of Pakistan; one is the product and income estimates at provincial level, and the other is the availability of high frequency (monthly or quarterly) data. The provincial income accounts, though not necessarily needed for the purpose of monetary and fiscal management or stabilization in prices and exchange rate, are very important for answering other types of questions including;

- What is the contribution of provinces to national output vis-à-vis their natural and human resources?
- Is the economic growth of the country balanced (i.e., is it spread evenly across the provinces)?

[3] Splicing can be used in two cases; (a) the variable is single, i.e. not a composite of other variables, (b) the variable is composite but the relative prices (weights) of component variables have not changed.

[4] As an example of changes in relative prices, note that wheat price to cotton price ratio during 1980-81 (the old base year) was 0.5, while it was 0.9 during 1999-00 (the new base year).

- Are provincial growth rates converging or diverging over time?
- What is happening to regional income disparities?
- In which sectors the provinces are performing well and which are underdeveloped?

In order to answer these and other questions related to regional economic development, and also to help provinces to construct their own development models, it is important to estimate gross provincial product (GPP). Provincial accounts can also prove to be useful for preparing provincial budgets and drawing up federal-provincial revenue sharing formulas on economic policy front and serve as a data base for economic research particularly in case of cross-sectional and panel studies.[5]

With regard to estimates of high frequency data, it may be noted that Kemal and Arby (2004) have recently quarterised the annual GDP and its sub-sectors at constant prices of 1980-81. However, there is a need to extend their work to new estimates of national income accounts at new base. Once the past data are adjusted according to the new methodology and new base, the revision of Kemal and Arby series would naturally be in order. The availability of high frequency data not only provide higher number of observations in quantitative works and thus improve their quality but also help identify and analyze the short-run and seasonal movements of economic activities. The seasonal movements have significant effects on the production, distribution, exchange and consumptions decisions of economic agents in the economy. It has also been argued that disaggregated data increase the likelihood of analytical accuracy in empirical works.[6]

### 1.2 Objectives of the Dissertation

This dissertation endeavors to address the above mentioned issues including estimation of past data of gross domestic product at new base of 1999-00 and disaggregating it into provincial and quarterly accounts. Moreover, as an application of the new series of economic growth rates, the contributions of capital and labour and total factor productivity (TFP) to growth would also be estimated.

[5] See Graham and Romans (1971) and Bengali and Sadaqat (2005) for some uses of regional accounts.

[6] See for example Orcutt et al. (1968).

This dissertation not only provides the researchers with new time series of gross domestic product at national and provincial level and with high frequency data but also contributes to enhance the knowledge of economic researchers regarding the compilation process of national accounts in Pakistan. It has explained, to the extent possible, the estimation technique of gross value added of various sectors of the economy, and also put together a lot of information relating to provincial economies and seasonal variations in Pakistan's economic activities.[7] It can not be overstated that an understanding of the data generating process will increase the quality of data analysis. The specific contributions of the present dissertation to the economic literature are the following: [8]

i) It provides a consistent set of national accounts at 1999-00 prices as well as at current prices for a period 1970-71 to date according to the new methodology.
ii) It gives quarterly data of GDP and all its sectors/sub-sectors both at constant prices of 1999-00 and at current prices.
iii) It presents estimates of provincial GDP and all its sectors/sub-sectors covering all the provinces in a consistent framework.
iv) It provides series of gross fixed capital formation and capital stock estimated at disaggregated level and at prices of 1999-00.
v) It estimates contribution of TFP, capital and labour to the growth of GDP and its sectors/sub-sectors (growth rates of new series at 1999-00 prices).

### 1.3 Structure of the Dissertation

In addition to this introductory chapter, the dissertation consists of eight other chapters. Chapter 2 presents a review of literature on national accounts including a description of different attempts made in Pakistan to improve national accounts estimation. Chapter 3 gives details of how rebasing of national accounts has been

[7] Earlier studies on estimates of provincial and quarterly accounts include Bengaliwala (1995), Kemal and Arby (2004) and Bengali and Sadaqat (2005); however, these studies were based on old methodology (see chapter 2 of this dissertation for further review of these studies).

[8] All the estimations mentioned here are limited to gross domestic product and its sub-sectors from supply side, i.e. agriculture, mining, manufacturing, services, etc. The other side of the national income accounts viz. consumption, gross fixed capital formation and net exports, shall be out of the scope of this study.

done in Pakistan. Chapter 4 consists of rigorous exercise of estimating the overall and sectoral gross value added at 1999-00 prices for a period from 1970-71 to 2004-05. The estimates have been made by using almost the same techniques as used by FBS for its annual accounts at new base. The next two chapters 5 and 6 present detailed descriptions of methodologies, assumptions and data used for quarterisation and provincialisation of national accounts respectively. The chapter 7 presents a detailed analysis of results of not only rebasing exercise but also of quarterisation and provincialisation. While summary tables relating to different sub-sectors of the gross domestic product have been reported in this chapter, the complete set of data at constant prices of 1999-00 and at current prices have been given in annexures. The last two chapters use the new series of national accounts in estimating sources of growth: chapter 8 presents estimation technique and results of new series of gross fixed capital formation and physical capital stock at constant prices of 1999-00, a time series of skill-adjusted labour force and estimates of factor shares; and chapter 9 presents a framework of growth accounting and estimates of total factor productivity.

# 2 Review of Literature

The literature relevant to the subject of this dissertation has been classified into three groups; general literature on national income accounts, specific studies on Pakistan's national income accounts, and studies on total factor productivity; a review of these studies has been made in the following three sections of this chapter. Embedded in this review of literature is an account of historical development of national accounts both in general and in particular in Pakistan.

## 2.1 General Literature on National Accounts

### 2.1.1 Estimation of annual national accounts

The systematic compilation of economic data into national accounts ranks among the most important innovations in the social sciences. The first estimates of national income appeared in the seventeenth century in England and were prepared by William Petty and Gregory King.[9] Studenski (1958) has given a detailed description of historical origin of the concepts and practices of accounts of national income and output. Drawing from Studenski, some of the key works of the early economists and statisticians in this field have been presented here. The first document on the subject was an essay called *Verbum Sapienti* by William Petty in 1665 that presented an estimate of the then current national income of England. Eleven years later, another article by the same author appeared with the title of *Political Arithmetick* which also presented estimates of England's national income and compared it with those of France and Holland. Another truly scientific attempt to estimate national income was made by Gregory King in his manuscript titled "Natural and Political Observations and Conclusions upon the State and Conditions of England" dated 1696. King used the terms of "annual income of the nations", "annual expense of the nation", etc. He also prepared separate estimates of per capita income, expenditure and savings for each social and economic class in England. In this way he obtained an estimate of the distribution of national income. Studenski has also reported the contribution of economists and statisticians belonging to other countries to the field of national

[9] See Stone (1984) for original tables of Petty's estimates of income and expenses for year 1664 and King's estimates for year 1688.

income accounts; the most notable of them is Quesnay from France. He is generally acknowledged to have invented the money-product flow analysis of national income – the approach that is at the very core of modern economic analysis. He called his tabular analysis as "Tableau Economique" that was accepted by his followers as important an invention as Newton's discovery of the law of gravitation (Studenski, 1958).

A further review of more classical work can be seen in Studenski (1958); we shall now jump over to the most prominent economist of the 20th century, Keynes who laid down the formal foundation of modern accounts with his booklet How to Pay for the War (1940) and whose followers contributed enormously to this subject (Heal and Kristrom, 2001). Although Keynes himself was not interested in compiling statistics, his theoretical work on economic phenomena at macro level led to a demand for official estimates of the national income and its components in United Kingdom. According to Hillinger (2003), Keynes also played a central role in the creation of the National Income and Product Accounts (NIPA) of US. The macroeconomic structure of his General Theory is reflected in the accounts and his political influence contributed much to their realization.

Among the followers of Keynes, James Meade began formally the task of compiling national income accounts and was joined by Stone, then a student of economics at Cambridge. Richard Stone received the Nobel Prize in 1984 for his work in setting up the accounts. The work of Stone and Mead came to the basis for the Accounts of Nations, to be further developed and refined with the development of the SNA. Stone also chaired a group at the League of Nations that subsequently prepared the 1953 edition of the System of National Accounts.

Vanoli (2005) presents a detailed history of national accounting along with an account of the evolution of the System of National Accounts and points out changes occurred in subsequent SNA's. He records that the 1953 SNA was a set of six standard accounts. They were based on an underlying structure of production, appropriation, capital reconciliation and external transactions accounts for the sectors including private enterprises, public corporations, government enterprises, households and the

general government. The entries were arranged and consolidated so that each of the six standard accounts related to one of the familiar and important aggregates, such as national income. In 1968, the second version of national accounts system was introduced with more detail and elaboration of different concepts of national income. It included more tables and expanded form of existing ones to fulfill growing needs of economic analysis. The 1968 SNA was widely used by different countries in compiling their national accounts. In 1993, the new system SNA-1993 was launched which retained the theoretical framework of the 1968 SNA. It is not a matter of a radically new system.

The 1993 System of National Accounts is a conceptual framework that sets the international statistical standard for the measurement of the market economy.[10] It is published jointly by the United Nations, the Commission of the European Communities, the International Monetary Fund, the Organisation for Economic Cooperation and Development, and the World Bank. The System of National Accounts consists of an integrated set of macroeconomic accounts, balance sheets and tables based on internationally agreed concepts, definitions, classifications and accounting rules. Together, these principles provide a comprehensive accounting framework within which economic data can be compiled and presented in a format that is designed for purposes of economic analysis, decision-taking and policy-making.

Being the most comprehensive macroeconomic standard, it also serves as the main reference point for statistical standards of related statistics such as the balance of payments, financial and government finance statistics. Being a conceptual framework, it does not attempt to provide comprehensive compilation guidance on how to make estimates nor is it descriptive in setting priorities which accounts and tables should be implemented or expresses norms on the frequency and format of their presentation. For practical compilation guidance, international agencies have developed separate handbooks like the handbooks of national accounting prepared by the United Nations Statistics Division.

[10] Source: http://unstats.un.org/unsd/sna1993/introduction.asp.

Recent aspects of globalisation and the appearances of new economic phenomena have led to new topics that warrant a comprehensive rather than an incremental update of 1993 SNA. News and latest progress about the ongoing worldwide comprehensive update towards the 1993 SNA Rev.1 mandated by Statistical Commission in 2002 can be found in the United Nation's website.

The changes consist mainly of clarifications and adjustments of concepts and definitions and enlargement of the scope of the system. Moreover the 1993 SNA has been harmonized with other related statistical systems, e.g. the Balance of Payments Manual (fifth edition) compiled by the International Monetary Fund.

The improvement in national income accounts is a continuous process. Economists and statisticians of almost every country undertake exercises of analyzing the quality of data, expanding the scope of accounts and making them available at higher than annual frequency and shorter time lags. We shall quote some of the authors who worked on the subject either for a specific country or presented a general analysis on different dimensions of national accounts including greening[11], regionalising or quarterising the accounts.

Tuke and Ruffles (2002) show the effects of annual chain-linking on annual growth estimates for household final consumption expenditure (HHFCE), exports and imports of goods. Annual chain-linking (ACL) is a method for aggregating volume measures of economic growth to better reflect the changing structure of industry and patterns of expenditure. They conclude that the combined effects of ACL on HHFCE, imports of goods and exports of goods show some similarities to the effect of ACL on the output measure, as would be expected in a coherent set of national accounts. The differences are likely to be because this model represents only part of the expenditure measure. Soo and Zina (2003) have also developed techniques of annual chain-linking of gross domestic product for UK.

[11] The greening of national accounts refers to incorporating environmental aspects of production processes in estimating the aggregate production and income.

Heal and Kristrom (2001) analyze in detail the conceptual foundations of national income accounts and they also discuss the issues relating to environmental aspects of the accounts. They have discussed three issues which seem particularly strategic in the context of implementing green accounting procedures, viz., valuation of ecological services, valuation of stocks and Transoundary pollution. They have also focused on attempts to reformulate national income accounts – such as the UN's proposed System of Economic and Environmental Accounts – and to its applications to particular countries.

Ando (2000) analyzes the national accounts of Japan and identifies where the reforms in accounts are most urgently required. Though the Japanese accounts follow the specifications of SNA 1968, a number of adjustments and modifications have been introduced in the system. However, there are inconsistencies in the data and mismatches between data appeared in different publications and between flow and stock data. He suggests a number of improvements in definitions and recording method of fiscal accounts, accounts of private financial and non-financial institutions which had a bearing on national income accounts.

Repetto et al. (1989) have drawn attention to the shortcomings of economic indicators. Using Indonesia as a case study, they conclude that the country's reported economic growth throughout the 1970s and 80s would be cut in half if GDP calculations were modified to a so-called "Net" Domestic Product, taking timber, oil, and soil depletion into account. This study is by no means the first to point out major shortcomings in national income measurements, but it has sparked a considerable debate about "green accounting" – integrating environmental and economic accounts. There are also number of other authors who criticized conventional income accounts and emphasized the need for taking into account natural and environmental aspects like Eisner (1988), Nordhaus and Tobin (1972), Lintott (1999), Nordhaus and Kokkelenberg (1999), etc.

### 2.1.2 Estimation of national accounts at higher frequency

The quarterisation of the annual estimates of national income accounts is another field that attracted the attention of many economists. The necessity of a larger set of

observations in empirical work led the economists and statisticians to invent methods of disaggregating annual data into quarterly data. Lisman and Sandee (1964) propose a mechanical technique for constructing synthetic quarterly data based on past trends in the annual data which gives reasonable estimates of quarterly series. Their criteria for reasonableness were:

i) The sum of the quarterly figures should, for each year, equal the given yearly total.

ii) Symmetry considerations, in particular the requirement that if the yearly totals in three successive years are $t_1$, $t_2$, and $t_3$, the quarterly figures for year 2 are the same but in reverse order from what they would have been had the yearly totals been $t_3$, $t_2$, $t_1$ (that is, had the yearly totals been reverse order).

iii) Trend considerations, in particular the desire that if the yearly totals in three successive years rise by equal steps ($t_2$-$t_1$ = $t_3$-$t_2$), the quarterly figures during year 2 should also rise by equal steps (of length 0.1*($t_2$-$t_1$).

iv) Cycle considerations, in particular the requirement that $t_2$-$t_1$ = $t_2$-$t_3$ (for example, a sequence 80, 100, 80), the quarterly figures during year 2 should lie on a sinusoid.

Lisman and Sandee (1964) showed that these four requirements lead uniquely to the following formula for quarterisation.

$$\begin{bmatrix} x_{1t} \\ x_{2t} \\ x_{3t} \\ x_{4t} \end{bmatrix} = \begin{bmatrix} 0.073 & 0.198 & -0.021 \\ -0.010 & 0.302 & -0.042 \\ -0.042 & 0.302 & -0.010 \\ -0.021 & 0.198 & 0.073 \end{bmatrix} \cdot \begin{bmatrix} X_{t-1} \\ X_t \\ X_{t+1} \end{bmatrix}$$

Where $X_t$ is annual figure in year $t$, and $x_{jt}$ is quarterly figure in quarter $j$ of year $t$.

This approach has a problem that no quarterly values can be inferred for the first and last year of the series. Boot et al. (1967) propose an alternative to address this

problem; however, as argued by Bloem et al. (2001) both the techniques of Lisman and Sandee (1964) and Boot et al. (1967) give the similar results.

Chow and Lin (1971) were the first to present a coherent econometric approach that handles interpolation and distribution problems for stock and flow variables. The basic idea of Chow-Lin technique is to find some GDP-related quarterly series and use best linear unbiased estimator to predict quarterly GDP figures such that the sum of quarterly figures match to annual aggregates. A similar multi-variate approach has been proposed by Somermeyer et al. (1976) which makes use of casual relationships to estimate quarterly values of an annually known variable. It assumes that quarterly values are weighted moving averages of annual values. The weights in this approach are estimated through a behavioral model by including variables with known quarterly values and known annual values. By imposing different constraints on the nature of weights and the unknown quarterly values an iterative procedure is applied to break annual values into quarterly components. It has been shown that the model performs well mainly where annual values of known variables follow a trend like pattern.

Fernandez (1981), and Litterman (1983) propose another approach that was based on Denton (1971) technique of minimizing a weighted quadratic loss function on the difference between the series to be estimated (e.g. GDP) and a linear combination of the observed related series. This strategy nests the Chow and Lin regression, but allows for more complicated assumptions about the driving process of the interpolated variable and the use of data in first difference.

Except the univariate mechanical technique like the one proposed by Lisman and Sandee (1964), other techniques require a larger set of data to undertake quarterisation. In case of developed economies, most suitable data in case of quarterisation of national accounts is often available at higher frequency like sales data, wages and salaries, tax returns, profits of firms etc. which can be used to get reasonable estimates of quarterly national accounts. However, it is important to note that despite the abundance of and variety of data sources in case of developed economies, recourse has often had to be made to interpolations and extrapolations on the basis of averages, moving averages, repeating preceding or succeeding

observations or even using simply judgments (Young, 1974). For example, the main basis of the Australian quarterly national accounts is stated to be interpolation based on various indicators which are not necessarily the constituent parts of the national accounts (Kennedy, 1969). In the United States also a significant part of the quarterly personal income is estimated through interpolation and extrapolation (Jaszi, 1965, and Brown, 1978).

A description of technique of estimating quarterly accounts in Netherland has been given by Jansenn and Algera (1988): an input-output table for each quarter is constructed with the row and column totals of the table representing the macroeconomic aggregates of the transactions in goods and services. The quarterly input-output table is obtained by a breakdown of the columns of the annual table into four quarterly columns on the basis of selected indicators and autonomous information related to the subject. In case of India, quarterly national accounts were estimated by Khetan and Waghmore (1972) for years 1951-52 to 1966-67.

The SNA 1993 also identifies some issues related to quarterly accounts which include:[12]

i) When using the System for short-term analysis, annual accounts are not sufficient because they do not generally permit the various short-term movements to be followed as closely as necessary. On the other hand, relying only on the analysis of short-term indicators is not an adequate alternative for various reasons. These indicators are very often incomplete in terms of coverage, and economic interrelationships are not always easily understandable through them. Further, changes in annual national accounts figures and in the corresponding statistical indicators may differ. National accounts try to be exhaustive, and they result from a process of trade-off and adjustment between basic data which are not fully consistent. Consequently, quarterly accounts tend to be broadly used in conjunction with short-term indicators, either current statistics or subjective business surveys. They are

[12] See paragraphs 19.84 to 19.85 of SNA 1993.

increasingly implemented in developing countries as well as in developed ones.

ii) No country establishes the complete system, including balance sheets, for every quarter. The coverage of quarterly accounts varies considerably from country to country. It consists in many cases of a calculation of GDP only, using a value added approach by broad economic categories, or a balance between GDP and its uses. At the other extreme, some countries try to cover most of current accounts and capital and financial accounts. As indicated above, quarterly accounts which are as complete as feasible may help overcome the difficulties of interpretation encountered with annual accounts in high inflation. Quarterly accounts for general government may facilitate the transition from fiscal year to calendar year when they are different.

iii) Quarterly accounts are based on intensive use of short-term statistical indicators. Some data used for annual accounts – for example, accounting data – are not available more frequently. When they are, they may not be fully available in time for early estimates. However, short-term indicators should be used with caution. Combinations of these indicators may differ from the corresponding annual national accounts figures. For instance, the annual changes of industrial output measured through monthly or quarterly surveys may differ from the results of annual surveys, where establishments and products are generally better covered, and both may differ from national accounts, which have to make estimates for the missing items, to use additional data and to check the overall consistency of the accounts. Because short-term statistics must be adjusted when used for quarterly accounts purposes, the most specific contribution of quarterly accounts work to national accounting is the study, generally using econometric methods, of the relationship between annual accounts figures and corresponding short-term indicators.

iv) Apart from deciding which parts of the system and what level of detail to use, quarterly accounts do not in general need adaptation of the conceptual framework. However, the correct definition and measurement of quarterly output requires much attention to be paid to the analysis of changes in inventories in general and work-in-progress in particular.

It may be noted that there is a common feature in the estimates of quarterly national accounts of both developed and countries and that is an extensive use of interpolation and extrapolation and different indicators in such estimates.

### 2.1.3 Estimation of regional income and product accounts

Although major focus of economists and policy makers has been on national accounts and developments of related concepts, definitions and techniques over time, regional accounts also acquired a status of a discipline in recent years. As argued by United Nations (1968) any system of national accounts could be sub-divided by region and in recent years a number of countries have been engaged in the construction of regional accounts. This development gives rise to a number of conceptual problems which are of only minor importance. However, there are also some practical problems associated with estimation of regional accounts that have been well documented by a number of studies.

Some of the problems have been identified by Hochwald (1957) who argues that economic transactions are defined in terms of ownership interests, operating in a national market under a national monetary system, rather than by regional boundaries. To the extent that the economic activities of these transactions are not confined to a particular region, serious problems of regional allocations may arise about the transactions to be included and classification of these transactions into regions in an exercise of preparing regional accounts.

Adler (1970) also confronted with some issues in case of regional accounting in Canada and noted that the major problem in the application of national accounts concepts to regional accounts is that certain flows of factor income and transfer payments which are net out nationally do not net regionally. This occurs because system of national accounts is designed to measure inter-institutional and inter-sectoral transactions that do not coincide with regional boundaries to the extent they do with the national borders. Some problems also occur in determining the economic region of origin of corporate profits, interest, flows of foreign trade, central government expenses, etc.

Another issue related to regional accounting is price differential as identified by some studies like Graham and Romans (1971) and Nair (1987) etc. Regional accounts estimates are primarily used to draw interregional comparisons of productive efficiency and standards of living. Herewith, it has to be taken into account that prices of factors and products, and changes in prices, are not uniform in all the regions across the country. Regional product or income, valued at national prices, can serve as an indicator of interregional productive efficiency. For comparisons of interregional standard of living differences, however, regional estimates have to be adjusted for interregional differences in the cost of living. The existing differences in per capita regional product or income are likely to change if the estimates are adjusted for interregional price differences. However, interregional cost of living indices are generally not available and their absence constitutes a major deficiency from a distributional point of view.

Capron and Thys-Clement (1992) address the methodological problems encountered in the building of regional accounts in Belgium. They offered a comparison with alternative choices concerning the regionalization of main aggregates made in some other countries. Wasserman (1967) presented alternative approaches for regionalization of French national income accounts.

SNA 1993 also gives an account of issues related to regional accounts; which says: [13]

i) Regional accounts are of special importance when there are important gaps between the economic and social development of the various regions of a country.
ii) A full system of accounts at the regional level implies treating each region as a different economic entity. In this context, transactions with other regions become a kind of external transactions. External transactions of the region have, of course, to distinguish between transactions with other regions of the country and transactions with the rest of the world.

[13] See paragraphs 19.88 to 19.96 of SNA 1993.

iii) Three types of institutional units have to be considered in the context of regional accounts. Firstly, there are regional units, the centre of interest of which is in one region and most of their activities take place in this region. Among regional units are households, corporations whose establishments are all located in the region, local and state governments, at least part of social security and many non-profit institutions serving households (NPISHs). Secondly, there are multi-regional units, the centre of interest of which is in more than one region but does not relate to the country overall. Many corporations and a number of NPISHs are in this situation. Finally, a small number of units are national units, which means that their centre of interest is really not located geographically even in the sense of multi-regional location. This is the case of central government and may be the case for a small number of corporations (probably public), generally in a monopolistic or quasi-monopolistic situation, like the national railway corporation or the national electricity corporation.

iv) Locating transactions of the regional institutional units does not raise any conceptual problem. These units are clearly regional resident units. Allocating the transactions of multi-regional units between various regions raises more difficulties. Even when these transactions are physically locatable, like output, it is necessary to actually value intra-corporate flows between establishments located in different regions. The System recommends including inter-establishments deliveries in the definition of output and this is especially important for regional accounts. A further consideration is that part of the transactions of multi-regional units is not, strictly speaking, regionalizable, in concept. This is the case for most property income and transactions in financial instruments. Consequently, balancing items of multi-regional units may not be unambiguously defined at the regional level for multi-regional units except value added and operating surplus. This means that, by definition, multi-regional institutional units may not be broken down in a number of regional institutional units.

v) One could argue that the measurement problems for multi-regional corporations are very similar to those of multinational corporations. There is obviously some similarity between these two kinds of enterprises. However, in

the case of multi-national corporations, national legislation and other considerations generally lead to establishing different legal entities in different countries. Even if these legal entities are not fully independent and the valuation of their external transactions within the same multinational corporation is not based on true market values, these units fulfill the conditions necessary to be treated as institutional units in the System. Only foreign branches which are not established as separate legal entities are in more or less the same situation as establishments belonging to multi-regional corporations. However, in the accounts of the nation as a whole, they are few in number and play a marginal role. Conventions of measurement in their case do not have an important impact on national accounts results. Moreover they are generally obliged to submit certain data. In regional accounts, on the contrary, these units are very common.

vi) The location of national institutional units raises more complex issues. In their case, breaking down their centre of interest between all the regions is conceptually dubious. Those units do not seem properly regionalisable. Of course, this does not mean that many transactions they carry out cannot be located in the regions, like sales of electricity and railway services or compensation of employees paid by central government. But it is not conceptually possible to regionalize their accounts totally. For instance, interest on the public debt payable by central government may not be geographically located (even when this interest is locatable when receivable by other units). The same is true for interest on their debt payable by national corporations. This probably leads to considering the introduction, in addition to the regions, of a kind of national sector, not allocated as such between the regions or constituting an extra region. This national sector would have establishments located in the regions.

vii) One may think of allocating all transactions of multi-regional units or even national units between regions according to some rules of thumb. However, this should not be considered simply as a practical approximation. It implies a conceptual adaptation of the System. The reasons which prevent including a full sequence of accounts for establishments/industries in the central framework also forbid, in principle, completely distributing all institutional

units and their accounts between regions, which means, in principle, building up a full set of accounts for establishments.

viii) These conceptual difficulties partly explain why no country establishes the complete System for every region. In most cases regional accounts are limited to recording production activities (with conceptual problems arising for locating some of them, like transportation and communication) by industry and more complete accounts for institutional sectors composed of regional units, like households and local and state government. Establishing accounts for goods and services and input-output tables by region does not raise unsolvable conceptual issues, deliveries to and from other regions being, of course, treated as exports and imports. However, the practical difficulties are very important in the absence of a sophisticated system of transport statistics.

ix) Nonetheless regional accounts, even with the limitations mentioned above, are a very useful tool for economic policy. Partial regional accounts may be inserted in a set of regional statistical indicators on labour participation, unemployment, poverty, etc. The greater the contrast between the regions in a country, the more useful is such a system of regional indicators, including GDP per capita according to broad economic categories, household disposable income and household consumption per capita. It is up to the countries themselves to devise their own regional accounts and statistical indicators, taking into consideration their specific circumstances, data system and resources which might be devoted to this work.

Lahr (2000), while giving his comments on regional accounts, suggested that three principals should be followed while producing regional accounts from national accounts:

i) When producing regional accounts from national accounts, use as much sectoral detail as there is available.

ii) When `regionalizing' national accounts, one assumes that technology is spatially invariant within a nation. This principle has been used by producers of industry-by-industry regional input-output models at least since Isard

(1951). This assumption allows the application of national Use Coefficient Matrices, albeit with some adjustment(s).

iii) Regionalization typically should be performed on domesticated national accounts. Most means of quantifying interregional trade fail to account for national exports originating from the region of study or for imports to a nation destined to the region of study. The regionalization schemes typically cannot account for international trade, especially imports. Thus, most regionalization methods must be applied on top of the domestication of national technology.

**2.2 Studies on Pakistan's National Accounts**

The first estimates of national accounts of Pakistan were prepared by the Economic Advisor's Office in 1949. On the setting up of the Central Statistical Office (CSO) in 1950, the job was transferred to CSO, now Federal Bureau of Statistics (FBS). The earlier estimates were limited to national product by industrial origin and were unsatisfactory in terms of their coverage and techniques. The earlier system of national accounts in Pakistan was reviewed thoroughly by a committee of experts on the national accounts headed by Henry J. Bruton who prepared the first report of its kind (Bruton 1962).

The Bruton committee not only reviewed the existing practice of compiling national income accounts but also presented a number of recommendations to improve them; they also recommended, among others, to estimate province-wise accounts and discussed issues related to such estimation. However, if their recommendations are compared with actual practice, one finds that many of their recommendations had been ignored by Central Statistical Office. It will be useful to reproduce the list of the recommendations given by the committee to improve the national accounts system in Pakistan.

<u>Bruton committee's Recommendations</u>

i) The national accounts should cover annual periods from July to June.

ii) The national accounts should contain separate estimates for each province (East and West Pakistan) and aggregate estimate for the country as a whole.

iii) The estimates should be presented in both, current and constant, prices.

iv) Central Statistical Office should present each year an integrated set of national accounts consisting of the following estimates:

   a. National product (i.e., distribution by industries)
   b. National expenditure (i.e., consumption and investment expenditure)
   c. National income by type of organization
   d. National income by distributive shares

   The Committee regards tables (a) and (b) above as the minimum number of tables for the presentation of national accounts. However, it is strongly recommended that in due course all accounts be included.

v) Each of these estimates should be prepared in accordance with the United Nations manuals on national accounts and with detailed recommendation presented in the subsequent parts of this report.

vi) All estimates should be published together with the relevant supplementary tables and explanatory notes indicating the methods and accuracy of the estimates.

vii) Estimates for each current year should be put together with the data for the past years in the form of time series.

viii) The time series of estimates should be followed by a broad analysis of changes in the size, structure and distribution of the national economic aggregates. This analysis should concern itself with the past trends in the national accounts as well as with likely developments in the year ahead with a view towards providing a better understanding of Pakistan's economic development.

ix) All the statistics, notes, and analysis as described in paragraphs (i) – (viii) above should be published annually by the Central Statistical Office under the title National Accounts of Pakistan indicating years covered by this publication.

Although the statistical agency could not implement all the recommendation, the usefulness of these recommendations cannot be overstated. Non-implementation of the recommendations has resulted into many handicaps in analytical work. For example, had the national accounts be available by type of organization (i.e. private enterprises, government, households, etc.) and by type of distributive shares (i.e.,

wages, farm income, rent, interest, etc.), the quality and quantity of economic research in Pakistan would have been manifold than at present.

Another important recommendation which was ignored was providing the accuracy of estimates; such information helps researchers to determine the level of confidence in their analysis. However, it is to the credit of Pakistan's statistical agency that it is compiling and publishing annual accounts almost regularly. Apart from the data series, the Federal Bureau of Statistics has also published certain documents giving detail of estimation technique like Gross National Product of Pakistan 1980-81 base (FBS 1989), National Accounts of Pakistan, Rebasing from 1980-81 to 1999-00 (FBS 2004) and number of brochures on national accounts. However, details of methodology have not been provided in fully transparent manner in these documents according to the spirit of the recommendation (vi) of the Bruton Committee. For example, Reviewing the latest publication by the FBS on the subject, i.e. National Accounts of Pakistan, Rebasing from 1980-81 to 1999-00 (herein after called Rebasing Book), one cannot find pit/well head prices of three core mining items viz., coal, crude oil and natural gas; similarly detail information of obtaining benchmark estimates of electricity, gas & water supply, public information and defence and social, community and personal services are missing in this report.

In April 1963, the President of Pakistan appointed a National Income Commission with the terms of reference of examining available data and the requirements for compilation of national accounts, recommending ways and means of collection of accurate and fuller data required for this purpose, and to give appropriate recommendations to improve national accounts compilation. The commission was headed by Mr. Abdul Qadir, former minister of finance, government of Pakistan. Some of the major findings and recommendations of the commission were the following:[14]

i) There was a great and immediate need for setting up an integrated system of national accounts, followed by input-output accounts. For this purpose, steps

[14] See Government of Pakistan (1965)

would have to be taken to collect basic data through special sample surveys and other means.

ii) The provincial government should collect variety-wise production and price data for all major crops where price differentials are substantial and provide the same to the Central Statistical Office (CSO).

iii) The coverage of production index was proposed to expand form existing 32 items with revision in weights that reflected true contribution of an industry in the sector.

iv) A census of distributive trade was suggested to be conducted in order to estimate the contribution of wholesale and retail trade in gross value added.

v) Value added in Postal Life Insurance should be included in banking, insurance and real estate sector.

vi) Provincial accounts separately for West and East Pakistan should be complied by Central Statistical Office. The CSO should also initiate a study for measuring the comparative purchasing power of the rupee in the two provinces and in different regions of each province.

vii) The commission also proposed a number of other special studies and surveys to improve the system of national accounts.

The system of national account was also reviewed by a mission from World Bank in 1969 as a part of its overall assessment of statistics in Pakistan (International Bank for Reconstruction and Development, 1970).[15] The mission gave its recommendations for institutional strengthening of the federal and provincial statistical system which also included renaming the CSO as Federal Bureau of Statistics.

After almost twenty years of the formation of the first National Income Commission, another committee was formed under the chairmanship of Mr. A.G.N. Kazi, Governor, State Bank of Pakistan in 1984 to review the present methodology for preparation of National Accounts and to propose improvements. On the recommendation of Kazi committee, national accounts were compiled at new base of 1980-81 (see FBS, 1989 for detail of changes in new estimates) along with number of

[15] The mission visited Pakistan during October to November 1969 and submitted its report in 7 volumes one of which was related to national accounts and non-agriculture sector.

other changes brought in compilation techniques like construction sector for which the use of cement production in estimating value added of construction was replaced with value added coefficients applied on investments taking place in different sectors. The Kazi committee also formed a number of technical sub-committees for different sectors. The recommendations of these committees were incorporated in new series of national accounts at 1980-81 prices.

For a long period of time the national accounts in Pakistan had been valued at constant prices of 1980-81. Realizing the need to update the base of accounts and to improve existing methodology, a technical committee on national accounts (TCNA) was formed under the chairmanship of Dr A.R. Kemal, then Chief Economist at Planning & Development Division on July 01, 1997. The Kemal's TCNA recommended to change the base from 1980-81 to 1995-96; it also pointed out short comings in the present system of national accounts and offered a number of recommendations to improve the accounts. A brief description of the recommendations of this committee is the following.

Kemal's TCNA Recommendations

i) The dichotomy of major crops and minor crops should continue but may be recomposed according to changed output profile.
ii) Output of crops may be augmented by acceding to non-reporting areas as well.
iii) Subsistence output of fruits and vegetables may be estimated.
iv) Re-authentication of the ratio of by-products to the crops is needed.
v) Development of the ratios of harvest prices to current prices for input-output table is required.
vi) Conversion of wholesale prices into harvest prices of minor crops.
vii) Input valuation in terms of seed rate, irrigation water, draught power, pesticides & fertilizer, wastage & transport charges, depreciation and agricultural services for each crop may be attempted.
viii) Double deflation with appropriate selection of deflators may be used to determine input-output structure of the sector.
ix) The data availability and adequacy in the realm of agricultural inputs, quantum and prices of agriculture. By products and crop-wise value addition should be

addressed with the help of Agricultural Crop Reporting Provincial Departments, Agriculture Price Commission and Research Organizations in the country.

x) Possibilities should be explored to collect data for estimation of quarterly accounts.

xi) Research studies should be conducted to estimate the subsistence output of crops, variety-wise production of mango and apple, under estimation of the output of banana, valuation of tube well (electric/diesel) water, improved seed rate, use of organic fertilizer, valuation of ploughing & planking cost, agricultural services and wastage.

xii) Productivity factor may explicitly be accounted for in estimation of agricultural output.

xiii) Separate estimates of AJK may also be attempted.

A number of above recommendations are still to be implemented. However, recently the FBS has changed the base from 1980-81 to 1999-00. For the purpose of this change of base, the Federal Bureau of Statistics has undertaken or commissioned a number of studies on different aspects of the national accounts under a Research & Case Studies (RCS) project,, which include:

<u>In-House Studies by FBS own Staff:</u>

1. Fishing
2. Shipping
3. Community, Social, Personal and New Emerging Services
4. Livestock
5. Mining & Quarrying
6. Public Admin & Defence
7. Slaughtering
8. Water Supply
9. Transport excluding Shipping
10. Financial & Insurance
11. Producer Price Index
12. Electricity & Gas

13. Agricultural Crops
14. Non-Profit institutions for Households
15. Construction
16. Large-scale Manufacturing
17. Supply & Use Table (SUT) 1999-2000

Out-sourced Studies:

1. Wholesale & Retail Trade, Hotels & Restaurants
2. Forestry
3. Savings in Pakistan
4. Depreciation Rates in Pakistan
5. Small-Scale Manufacturing
6. Capital Formation in Pakistan

In addition to above studies, FBS also conducted a census of software industry and related services in Pakistan (FBS 2002). In general these studies presented latest raw data on relevant sectors, developed the estimates of gross output, input, gross value added and gross fixed capital formation. The studies also recommended new indicators (new benchmark values of old indicators) of constant growth being used in some sectors. The contribution of emerging economic activities like computer software, hardware installation & maintenance, mobiles phones, etc. to gross domestic product was also estimated by these studies.

Coming towards the quarterly national accounts in Pakistan, Bengaliwala (1995) made the first comprehensive attempt to estimate quarterly values of real gross domestic product at constant prices of 1980-81 and its sub-sectors for the period 1971-72 to 1989-90. The study applied product approach for commodity producing sector and income approach for services sector by using both direct and indirect data sources and subjective information about the seasonal patterns in the economy. Although the study adopted various suitable allocators to quarterise a number of sub-sectors of the economy, it just divided annual value added of a number of other sub-sectors into four equal parts; such sectors included livestock, mining and quarrying, communications, ownership of dwelling and public administration and defence – the

combined share of these sectors in total GDP is 22 percent on average; it implies no seasonal variations have been assumed for more than one fifth of the GDP which seems implausible.

Haq (1999) also undertook an exercise of quarterisation of GDP independently which was similar to Bengaliwala (1995); the series though publicly not available exhibited similar seasonal pattern as Bengaliwala (1995) series.

Recently a study was undertaken by Kemal and Arby (2004) on quarterisation of annual GDP of Pakistan, which presents the quarterly estimates of GDP and its sub-sectors using the maximum available information on the seasonal pattern of economic activities and keeping the technique as close to annual accounts as possible. However, their estimates of quarterly GDP are also at constant prices of 1980-81 like Bengaliwala (1995) and Haq (1999). However, the technique they adopted can be applied to national accounts with base prices of other years.

Bengaliwala (1995) also attempted to estimate regional values of real gross domestic product at constant prices of 1980-81 for the period from 1971-72 to 1989-90. His work was extended to year 1999-00 by Bengali and Sadaqat (2005) by using the same methodology. It is learnt that some estimates of GDP in provinces of Punjab and NWFP have also been made under some international donor's projects; however, the results of such studies are not publicly available.

### 2.3 Literature on Total Factor Productivity

Economists are often keen in exploring what causes economies to growth over time. The possible sources of economic growth are increase in the level of inputs like labour and capital and some technological changes that enable the given level of inputs to produce more. The impact of technological change is usually referred to as Total Factor Productivity (TFP) in the literature, and economists have used a number of approaches to measure the TFP. Although the economic theory of productivity measurement goes back to the work of Jan Tinbergen (1942)[16], Solow's work (1957) was the foundation of formal models and empirical exercises on the sources of

[16] Quoted by Hulten (2000) and (OECD, 2001).

economic growth. Solow's neoclassical growth model gave the theoretical framework for quantifying the contribution of total factor productivity (TFP) and traditional inputs to the growth of gross domestic product (GDP). Hulten (2000) has provided a biographical review of different techniques and concepts relating to productivity measurement including classical work on the subject like Jorgenson and Griliches (1967, 1972), Hall (1968), Hulten (1973), Griliches (1973), Denison (1962, 1972), Diewert (1976), etc. We shall review some of the empirical studies undertaken in recent years for certain individual or group of countries.

Young (1995) in his thought provoking paper analyzes the historical patterns of output growth, factor accumulation and productivity growth in the newly industrializing countries of East Asia, i.e., Hong Kong, Singapore, South Korea and Taiwan. He found that contribution of total factor productivity to overall economic growth was 0.2 percentage points in Singapore, 1.7 in Korea, 2.3 in Hong Kong and 2.6 in Taiwan. In case of manufacturing industries it ranged from a low of -1.0 percent in Singapore to a high of 3 percent in Korea. His main conclusion was that similar productivity growth also occurred in other countries but with lower growth rates than East Asian countries; thus the productivity growth rate does not explain the growth experience of these countries; instead it is capital accumulation that upheld high growth rates. Collins and Bosworth (1996) reinvestigate the issue of the sources of East Asia's rapid Growth in output by extending their research to seven countries. The empirical framework is provided by a set of growth accounts that decompose the growth in output per worker from 1960 to 1994 into the contributions from the accumulation of physical and human capital and a residual measure of the change in total factor productivity. They find that TFP contributed 0.8 percentage points to the per worker output in Indonesia, 1.5 in Korea, 0.9 in Malaysia, -0.4 in Philippines, 1.5 in Singapore, 1.8 in Thailand, 2 in Taiwan, and 1.1 in East Asia as a group during the period 1960-94. The central result of their study reinforces Young's and others studies who have concluded that TFP growth played a small role in East Asian success.

Senhadji (1999) conducts a growth accounting exercise for 88 countries for a period of 1960-94 and tried to find sources of cross-country differences in total factor productivity level. He grouped the 88 countries into six regions and assumed that

production functions are identical across countries within regions but different among countries across regions. Unlike many other studies that used non-parametric approaches, he adopted parametric approach by estimating production function through Fully-Modified (FM) estimator developed by Phillips and Hansen (1990) and Hansen (1992). His results show that contribution of TFP to growth rate of real GDP was 0.79 in East Asia, 0.91 in South Asia, -0.52 in Africa, 0.75 in Middle East and North Africa, -0.24 in Latin America, 0.83 in industrial countries and 0.23 in the world as a whole during the period of 1960-94 (setting the value of $\alpha = 0.4$ in Cobb Douglas production function, $Y = AK^{\alpha}(LH)^{1-\alpha}$; he has also reported results with other estimates of $\alpha$). He concluded that initial conditions, terms of trade shocks, economic and political stability explain the differences of TFP among different groups of countries.

Klenow and Rodriguez-Clare (1997) offer new evidence related to the debate on relative importance of productivity and capital (physical and human) accumulation in explaining the international differences in levels and growth rates of output. Using their own estimates of human capital, they found that productivity differences account for half or more of level differences in 1985 GDP per worker. They also carried out growth accounting and found that differences in productivity growth explain the majority of growth rate differences across countries. Their development level or growth accounting exercise was based on a sample of 98 countries including Pakistan; they worked out TFP growth for Pakistan as 2.68 during the period 1960-84 which is higher as compared with the results of other studies on Pakistan.

Similar results have been obtained by Easterly and Levine (1999) through more rigorous research and use of superior techniques. They documented five stylized facts of economic growth, i.e., (i) The "residual" rather than factor accumulation accounts for most of the income and growth differences across nations, (ii) Income diverges over the long run, (iii) Factor accumulation is persistent while growth is not persistent, (vi) Economic activity is highly concentrated, with all factors of production flowing to the richest areas, (v) National policies exert a large influence on long-run economic growth rates. They conclude that major empirical regularities of economic growth emphasize the role of total factor productivity growth. The TFP residual

accounts for most of the cross-country and cross-time variation in growth. Income across countries diverges over the long-run, which is incompatible with the neoclassical model stressing capital accumulation (with diminishing returns) as the main source of growth. Growth is highly unstable over time, while factor accumulation is more stable, which certainly emphasizes the role of "something else" in explaining variations in economic growth. They also note that national policies influence long-run economic growth even after controlling for transitional dynamics; this further suggests a key role for productivity growth. Moreover, it has been shown that all factors of production flow to the richest areas, suggesting that they are rich because of high productivity rather than high capital stock. Finally, they note that divergence of per capita incomes and the concentration of economic activity suggest that technology has increasing returns.

Guha-Khasnobis and Bari (2000) analyze the growth performance of South Asia through a descriptive analysis as well as in a growth accounting framework. They also study the determinants of growth in these countries. In their analysis, the role of capital accumulation in GDP growth came out quite strong. They also find that TFP, if not very large in absolute terms, was significant enough in a relative sense (i.e., in terms of its percentage contribution to GDP growth). In particular, they find that across countries and periods, higher growth rates of TFP were associated with higher GDP growth rates. They find that the factors that had contributed to higher growth in East Asia, but in which South Asia have been lagging behind, include schooling, openness, strength of institutions, and government spending. The openness factor explains most of the TFPG difference between East and South Asia.

There are also a number of studies analyzing the productivity trends in individual countries. For example, Hu and Khan (1997) have examined the sources of Chinese economic growth and found that contrary to the tradition, efficiency was the driving force behind the Chinese economic boom, with sharp productivity increases explained by economic reforms that started in 1978. Amin (2002) estimates contribution of TFP growth for Cameron during 1961-97 using both parametric and non-parametric approaches. The results show that over the period, the total factor productivity (TFP) vary around zero for all three sectors, with the means for the period being 0.0501 for

agriculture, 0.0473 for industry and 0.0389 for services. He finds that the contribution of the growth of factor inputs is greater than the contribution of total factor productivity, with capital input playing a larger role. However, the results do show high growth rate of total factor productivity, thus suggesting the potential and growing importance of TFP in the growth process. Mrkaic (2002) has measured the dynamics of TFP in Slovenia by assuming a Cobb–Douglas production function for the period 1992 to 2000. Deviating from usual practice of estimating capital stock series through perpetual inventory method (PIM), he estimated the capital stock by exploiting the condition that the marginal product of capital must be equal to the user cost of capital (the real interest rate plus the rate of depreciation). The method allowed him to determine the dynamics of TFP in Slovenia by using time series data on net investment, employment and real interest rates, all of which were readily available and measured with reasonable accuracy. The results of his study showed that TFP in Slovenia grew fast in the early 1990s, and that the growth slowed significantly and reached negligible annual rates in the second half of the 1990s (in the range of -0.02 to 0.009). Fukao (2003) analyze the impact of foreign direct investment on total factor productivity of Japanese firms. In order to do so, he compares the performance of foreign-owned firms with that of domestically-owned firms, using micro data of Japanese firms in the manufacturing sector for the period of 1994-1998. The results regarding the overall comparison between foreign-owned and Japanese companies showed that foreign-owned companies enjoyed 10% higher TFP as well as higher earnings and returns on capital. The implications of these results are that foreign-owned firms in Japan possess superior technologies than their domestically-owned counterparts due to access to the parent's intangible asset and that Japan was benefiting from inward FDI.

In case of Pakistan also a number of studies explored the status and role of productivity for overall and sectoral growth of gross domestic product. Cheema (1978) reports gains in productivity in manufacturing industries of Pakistan for the 1959-70 period. He observes rather erratic trends in productivity gains arising from sharp fluctuations in the capital stock. In view of the fact that he used CMI data without making any adjustment for under-coverage of the firms and understatements of capital, such results were hardly surprising. Kemal (1978) reportes gains in

productivity in manufacturing sector over the period of 1960s; these estimates are also based on CMI data, however, adjusted for both under-coverage and understatement of capital stock. The study finds that over 1959-60 to 1969-70 period, total factor productivity in manufacturing industries increased at a rate of 5.06 percent. The gains in productivity estimated through Cobb-Douglas and CES production functions are also quite similar to those estimated through the ratio method. The study also found some evidence on capital saving bias in the technical change in Pakistan. Capital saving bias in 1960-70 period, however, has been a reflection of an increase in capital utilization rather than the development of capital augmenting technical change. Ahmed (1980a, 1980b) examines changes in productivity in manufacturing industries of Pakistan. He selects a sample of those firms which has provided CMI data for all the years. He also points out gains in labour productivity, though the level of productivity continued to be low. Wizarat (1981) estimates technological change in Pakistan's agriculture and concluded that productivity declined over the 1954-60 period, increased slightly over the 1960-65 period, and very rapidly in the 1965-70 period (with a rate of 6.9 percent per annum). Technical change contributed as much as 84 percent to the growth of value added in this period. While her results were quite interesting, they suffer from various problems especially those relating to incomplete data of capital stock. Islam (1991) also studies trends in productivity in case of agriculture and showed that over the 1950-83 period, productivity gains explained 34 percent of the increase in value added in agriculture. The gain had been smallest in the 1950-55 and 1970-78 periods, i.e., 12 and 17 percent respectively and had been the highest in the 1965-70 periods, i.e., 55 percent.

Looking at the overall growth of output in Pakistan, Burney (1986) estimates sources of growth for the entire economy and concluded that whereas in the sixties, residual accounted for more than half the increase in value added, its significance fell in the seventies and by 1979-80, it was less than one quarter. However, it increased subsequently to one third in the 1980 to 1985 period. Burney's estimates also suffer from the poor data on capital stock. He seems to have overestimated the capital stock in 1959-60 which yielded lower growth rates of capital in sixties. This is in sharp contrast to the fact that investment in 1964-65 has been the highest in Pakistan.

Kemal (1992) estimates the contribution of total factor productivity and capital and labour to growth rates of gross value added (or output in case of agriculture and manufacturing) during the period of 1950-91. His results show that on average the contribution of TFP growth was negative (-0.56) during this period; however, there are some periods when it was positive including the period of fifth plan 1978-83 (0.91), the period of sixth plan 1983-88 (0.74) and the period of seventh plan 1988-91 (0.88). The contribution of total factor productivity to the growth of agricultural output growth was estimated at 0.94 for the period of 1950-91; 1.1 to the growth of manufacturing output during the same period; and -0.5 to the growth of other sectors of the economy (taking together).

Kemal et al. (2002) estimate total factor productivity (Solow Residual) in case of Pakistan for the period from 1964-65 to 2000-01. They estimate TFP for the whole economy as well as for the agriculture and mining and manufacturing sub-sectors. Whereas TFP grew by 1.66 percent for the whole economy, sectoral growth rates in TFP stood at 0.37 percent and 3.21 percent respectively for agricultural and mining and manufacturing sectors. The results show that Total Factor Productivity has contributed 31.26 percent to the aggregate growth, 9.57 percent to growth in agricultural output, and 50.27 percent to the growth in the manufacturing sector.

All the above studies on Pakistan's economy used old data and attempted to examine only few sectors of the economy. In the present dissertation, we have used the latest data set with improved techniques of estimating physical capital stock and skill-adjusted labour input and examined the trend in the contribution of total factor productivity in overall GDP and all its sub-sectors.

# 3 Rebasing of National Accounts

National income and product accounting is one of the major branches of national economic accounting in a country, which illuminates some important aspects of the structure, working and performance of the economy. All countries are compiling national income and product accounts that include the key aggregates like consumption, investment, gross domestic product, gross national income, etc. The national accounts aggregates are estimated both at current and constant prices: the current estimates are the national income and product valued at prices prevailing in the same year for which estimates are being made, while constant estimates are national income and product valued at some base year prices. The national accounts aggregates at constant prices provide very useful indicators for measuring real growth in the economic activities because they exclude the impact of price changes on overall value of these aggregates. However, the base year prices selected for valuing national accounts aggregates tend to become progressively less relevant as the pattern of relative prices changes over time (see Box 3.1 on impact of changes in relative prices at the end of this chapter). Therefore it is necessary to update the base period to adopt weights that are more consistent with current conditions.

There are also some other important reasons for revision of base year including changes in the production structure in the economy over a period of time; appearance of new products in the market due to continuous developments and innovations; disappearance of a number of other products due to changes in taste or availability of better alternatives; and non-comparability of goods and services between far apart periods due to quality changes. Furthermore, on the final demand side as well structural changes do appear in the consumption patterns and utilization and acquisition of capital goods. All these factors justify that it is absolutely desirable to rebase the national accounts series periodically. As the changes in structure of production or consumption appear almost continuously, it further justifies more frequent rebasing. Rebasing on an annual basis and annual chaining of volume

indices[17] would of course be the most ideal proposition as recommended by the SNA 1993. The SNA 1993 argues that annually-reweighted chain volume measures should be compiled to aid the analysis of economic statistics as they provide better indicators of volume growth than base-weighted constant price estimates for most economic statistics relating to production and expenditure. However, such an index requires additional basic data on quantities and prices.

### 3.1 Technique of Rebasing of National Accounts

Rebasing of national accounts series refers to replacing the old base year used for compiling the constant price estimates to a new and more recent base year. The process starts with new estimates of ingredients of national income and product at the most detailed and basic level along with a collection of prices of goods and services prevailing in a typical year (base year) and performing the aggregation from this detailed level to the main national accounts aggregates. It is almost impossible to apply a single method to estimate constant price value of all economic activities at their basic levels; therefore, national accountants use different approaches for different economic activities. Three main approaches are used for this purpose: revaluation, deflation, and volume extrapolation. As an illustration of these approaches, consider national accounts with existing base year of 1980-81[18] which is to be rebased to a new base year 1999-00; the following steps are involved at a detailed compilation level:

1. For the economic activities or aggregates of which volume (quantity) measures are available, the constant price estimates are obtained by *revaluation*. In this case, a change of base year involves replacing the 1980-81 prices currently used with 1999-00 prices for the same items. For example, rebasing of major and minor crops, and mining and quarrying can be done by revaluation technique (details are given in relevant sections below).

[17] The annual chain volume index allows the base year to be updated every year instead of every five or ten years as is the case with fixed weight measures. Calculations are carried out in previous years' prices and aggregated to give chain volume measures.

[18] A financial year in Pakistan starts in July and ends in June; thus the year 1980-81 refers to July 1980 to June 1981.

2. For the economic activities or aggregates that are usually initially estimated at current prices and their constant price estimates are obtained through *deflation*, a change of base year involves changing the reference period from 1980-81 to 1999-00 for the deflators used at the most detailed level. An example for rebasing by deflation is finance and insurance sector.
3. There are some economic activities or aggregates for which it is difficult to estimate their values every year; thus based on some quantity indicators their constant price estimates are obtained through *volume extrapolation*. Under this approach, a change of base year involves changing the period from which the levels are being extrapolated. Volume extrapolation is commonly done either by: (i) multiplying the current price value in the base period with a volume index (with the base period as reference period) showing the change from base period, or (ii) multiplying the constant price estimate for the previous year with a volume indicator showing the change from the previous year. In case Pakistan, rebasing of value added of small-scale manufacturing and ownership of dwelling are examples of volume extrapolation.

### 3.2 Re-basing in Pakistan before 1999-00

The estimates of national income in Pakistan were initially prepared only in current prices by the Central Statistical Office. However, with the inception of First Five Year Plan, a need was felt for an objective measure of economic growth.[19] Emphasis, therefore, shifted from current to constant prices as the base of estimation. During the first three or four years following the publication of the estimates for 1948-49, prices fluctuated widely and consequently in 1954 it was decided that the price base for the new constant series should be the average of 1949-50 to 1952-53 prices. The new estimates were only available for years 1949-50 onward; consequently the very first estimate of national account for the year 1948-49 was not comparable with those in subsequent years. With the adoption of constant price estimates, the current price series was discontinued which was re-introduced in 1963.

In 1963, with report of the National Income Commission the national accounts were re-based at 1959-60 prices. The gross value added in all the sectors was revalued at

[19] See Government of Pakistan (1965) p 16.

prices of 1959-60 for the years 1959-60 onward. However, no exercise was done to rebase national accounts for years prior to 1959-60. The rebased series for past years was made available in 1968 with the publication of a book titled 25 Years of Pakistan in Statistics 1947-1967.

Further change of base for national accounts could be undertaken in mid 1980s after a couple of failed attempts to change the base from 1959-60. In 1972-73, FBS undertook an exercise for switching over the base from 1959-60 to 1969-70. These estimates were presented before the National Accounts Committee but could not be adopted due to inconsistencies in the estimates of manufacturing sector. The Committee directed the FBS to prepare estimates with 1975-76 base. A comprehensive work plan was then prepared for improving the existing data series and plugging in the statistical gaps. Some surveys such as wholesale and retail trade, small and household manufacturing industries were conducted for this purpose. The estimates with base 1975-76, on improved data availability, concepts and methodology were prepared for the year 1975-76 through 1983-84 and presented before the Committee but the same too could not be adopted due to persistent inconsistencies. It was 1989, when FBS succeeded to change the base of national accounts from 1959-60 prices to 1980-81 prices in the light of the recommendations of A.G.N. Kazi Committee (FBS, 1989). The FBS released new estimates of national accounts for the years 1980-81 onward at new base and once again no attempt was made at that time to re-base the past series. All the statistical publications continued to report two sets of data on national accounts; one based on old methodology for years up to mid 1980s with constant prices of 1959-60 and the other based on new methodology for years 1980-81 onward with base prices of 1980-81. Then in 1998, a consistent historical series of national accounts at base prices of 1980-81 was published in a book titled 50 Years of Pakistan in Statistics (4 volumes). In this publication, the old series was converted at new base by a method of splicing which implies no detailed exercise was made to re-price the economic activities in different sectors.

As per recommendations of the A.G.N. Kazi Committee, the national accounts were to be again re-based after 10 years and the new base had to be 1990-91. As pointed

out in FBS (2004), attempts were made to change the base year first to 1990-91 and later to 1995-96. These attempts, however, failed for one reason or the other. The result was that national accounts estimates based on benchmark of 1980-81 became antiquated and could not capture the true structure and parameters of economic and technical/technological changes which had occurred during the last twenty years.

The issue of rebasing the national accounts estimates, therefore, gained prime importance. The Annual Plan Coordination Committee (APCC) meeting held in March 1997 considered this issue and recommended to improve and rebase the national accounts of Pakistan to make the GDP and investment figures more realistic. Accordingly, a Technical Committee on National Accounts (TCNA) was constituted in the Federal Bureau of Statistics (FBS) for improvement and rebasing of national accounts of Pakistan. This committee was headed by Dr. A. R. Kemal, Director, Pakistan Institute of Development Economics (PIDE). Eight technical sub-committees were further set up to assist the Committee to look into the sectoral issues individually. The committee examined the sectoral inadequacies of existing practice, examined the constraints and proposed an action plan to bring national accounts estimates in line with the latest accounting framework of 1993 UN System of National Accounts (SNA). The Committee also proposed to conduct a number of studies to ensure methodological improvements and data adequacy. As result of such concerted efforts, the FBS could develop new series of national accounts in year 2004 with a new base of 1999-00 prices. It released new base series of national accounts for years 1999-00 onward; and like its past practice no attempt was made to re-base the past data. The features of this latest re-basing have been described in the following section.

### 3.3 Re-basing of National Accounts in 1999-00

After a gap of about 20 years, the Federal Bureau of Statistics (FBS) undertook an exercise to re-base the national accounts from 1980-81 to 1999-00. During this exercise, it not only changed the base for constant price estimates of national accounts but also improved estimation techniques of value added in a number of economic

sectors. A description of methodology adopted by FBS to re-base different sub-sectors of gross domestic product is given below.[20]

### 3.3.1 Agriculture

Agricultural related activities are growing of crops, harvesting and threshing, growing of trees & logging, fishing, breeding and rearing of animals and poultry, production of milk, eggs, dung, raw wool etc. For the purposes of computation of value added estimates, the sector has been divided in to the following four sub sectors.

- Crops
- Livestock
- Fishery
- Forestry

*Major and Minor Crops:* The contribution to the gross domestic product (GDP) of agricultural crops has been estimated by product approach.[21] It involves estimation of gross value of products and by-products, estimation of inputs like seed, fertilizer, pesticides, water and agricultural services viz. tractors and draught power for ploughing, planking, sowing, harvesting and thrashing etc.

The estimates of production of major and minor crops[22] are obtained from different agencies like Provincial Department of Agriculture, Agriculture Extension and Crop Reporting Services. The estimated output of by-products of major crops is obtained as percentages of the respective crops products collected as subsidiary information through objective crop cutting surveys supplied by Provincial Directorates of Agriculture and Crop Reporting Services. The harvest prices of respective crops have been obtained from the Provincial Departments of Agriculture, Department of Agriculture Extension, Directorate of Crop Reporting, Provincial Economic and

[20] This section is based on FBS (2004) "National Income Accounts of Pakistan: Rebasing from 1980-81 to 1999-00".

[21] In the product approach, goods and services produced in the economy are measured; in the income approach, compensations to factors of production are aggregated. Theoretically, both the approaches give the same result.

[22] Major crops include wheat, cotton, sugarcane, rice, jowar, bajra, gram, sesamum, barley, maize, tobacco, rapeseed & mustard; minor crops include different types of vegetables, fruits, pulses and condiments.

Marketing Department.[23] For some of minor crops, where no harvest prices from any source were available, wholesale prices compiled and issued by the Department of Agriculture Marketing & Grading and Provincial Departments of Economics and Marketing have been used after netting out the effect of trade and transport margins.[24]

With the rebasing of crops already covered in national accounts, the FBS also included other crops for the first time in the estimation of gross value added of crops sector like strawberry, mushroom, betel leaves, tea, henna (myrtle), flowers and foliage, and number of vegetables. The estimates of gross production at new base of 1999-00 were also improved in terms of using more relevant prices. For example, in the old series the WPI for wheat (released) was used also for most of the by-products of major crops such as gram bhoosa, rice husk, bajra and Jowar stalks, maize pith etc., while in new estimates, by-products of different crops have been valued at their own prices.

Some changes in estimation of intermediate inputs were also observed in new estimates. For example, the value of seed used, in the 1999-00 based estimates is more than double, while that of fertilizer is significantly less than the 1980-81 based estimate. Under the re-basing exercise, the value of seed at new base was worked out on the basis of crop-wise area sown in each province and per acre use of seed. The seed rates have been compiled on the basis of information made available by the Provincial Departments of Agriculture, Agriculture Extension, Crops Reporting, Agricultural Price Commission and Agriculture Seeds and Supplies Corporations. The quantity of seed by crops so derived has been multiplied by the corresponding prices prevailing in the year 1999-00. The major element in the increase of value of seeds is the higher prices of improved seeds. FBS has collected the prices from the Provincial Agriculture Departments, Provincial Economics and Marketing Departments, Department of Crop Reporting. For the certified seed, data of Federal Seed Certification and Registration Department have been used. For wheat, rice, cotton and

[23] In the old series, benchmark estimates of harvest prices of 1980-81 were extrapolated with the WPI due to non-availability of any reliable data.

[24] Trade and transport margins are based on a study on Wholesale and Retail Trade conducted by Federal Bureau of Statistics.

sugarcane the information contained in the reports of Agriculture Prices Commission have been utilized.

On the other hand, the value of fertilizer has been estimated on the basis of data on variety-wise quantity and value of fertilizer sold to the farmers. The National Fertilizer Development Centre, Ministry of Planning and Development; Fertilizer Imports Department, Ministry of Food and Agriculture, Fertilizer Development Cell, Agriculture Seed and Supplies Corporation, Provincial Bureaus of Statistics, have supplied the information on sale, stock and consumption of fertilizer. The information on off take/consumption of fertilizer in product tons and nutrient tons, and its value have been compiled on provincial basis by source of availability. The new benchmark estimates have been obtained from National Fertilizer Development Center, Planning and Development Division, which they have worked out for each item separately. Value of the fertilizers, in 1980-81 based estimates, had been calculated from extrapolated benchmark prices. The index of WPI used for fertilizers is more than 800 percent, while WPI, for the same period, of active ingredients of pesticides was 350 only. Thus the old estimates were highly overestimated due to unrealistically high prices.

The value of water, in the revised benchmark estimates, is higher due to proper valuation of tube-well water while in the old series value had been extrapolated by index. In the revised series the transport charges and wastage has declined. The cost of water has been estimated separately for canal water and tube well water. Canal water data have been obtained from Indus River System Authority, Ministry of Water and Power; Agriculture Water Management Department Punjab; Irrigation and Power Department, Sindh; Provincial Agriculture Departments NWFP and Balochistan; Agriculture Prices Commission, Ministry of Food and Agriculture; Planning and Development Division; and Agriculture Statistics of Pakistan. Data/Information available with Provincial Boards of Revenue, and WAPDA was also reviewed for reconciliation of the data between the different sources.

The cost of other intermediate inputs like ploughing, planking and sowing through tractor and draught power has been estimated on the basis of per acre cost of crops

derived from the different studies conducted by Agricultural Price Commission, Planning and Development Division.

*Livestock:* After crops, livestock is another important sub-sector of agriculture[25] which includes the value of livestock products and draught power. The sub-sector has been further divided in to the following broad categories.

- Net sale of animals (for slaughtering)
- Natural growth of animals
- Livestock Products
    - Milk Production
    - Draught Power
    - Dung and Urine
    - Wool and Hairs
    - Poultry Products

In old base estimates, slaughtering activities were included in agriculture sector but in new estimates these are excluded from agriculture and included in manufacturing in line with the SNA 1993. The gross output of the livestock sub-sector is valued at producers' prices and is equivalent to the total production of the livestock products multiplied by their respective prices.

The net sales were previously ignored in the livestock but presently these are being incorporated as per 1993 SNA recommendation. The estimates of net sales are made as a product of prices on animals prevailing during 1999-00 and number of animals sold for slaughtering. The natural growth of animals was also ignored in old base series of national accounts which has now been incorporated. The animals in livestock are divided as under according to their age specific groups, i.e. adult and young males and females. The young males and females with the age one year and below have taken as a part of natural growth in a particular year.

For the valuation of livestock products, i.e. milk, dung and urine, wool and hairs, and poultry products, quantities have been taken from agricultural statistics of Pakistan

[25] In recent years, the direct contribution of livestock in gross domestic product has become even higher than crops.

and prices have been taken from the Agriculture and Livestock Products, Marketing and Grading Department. Number of birds and eggs has been taken from the Livestock Division and prices for chicks and other inputs have been collected from Poultry Research Institute (PRI).

Draught power has been subject to decreasing trend due to mechanization of agriculture sector and replacement of non-mechanized road transport with light transport vehicles like auto rickshaws and motor cycle rickshaws. However the use of animal for power is in practice. The estimate of draught power has been developed by comparing the output with the equivalent work done by mechanized power. While in the old base of 1980-81, the benchmark contribution of draught power was estimated on the basis of expenditure to maintain work animals like fodder, stalks, salt and medicine.

The inputs of livestock are mainly derived from Agriculture sector. Emphasis on better rearing and catering, intensive use of medicines and health care services, and commercialization of dairy farming has led to diversification of input structure. The shift-in farming structure has brought about the use of expensive fodder and other inputs. For the intermediate consumption, fodder, medical care, transportation, interest, value of chicks, poultry feed etc. have been taken in to consideration.

*Fishing:* The third sub-sector of agriculture is fishing which covers commercial and subsistence fishing in ocean, coastal and offshore waters and inland waters. This includes catching, tackling and gathering of fish from rivers, canals, lakes, fish farms, ponds and inundated tracts. The data on quantity and value of commercial and subsistence fishing (inland and marine) have been obtained from Marine Fisheries Department, Ministry of Food & Agriculture, and from the Provincial Fisheries Departments. The value of marine fish catch is reduced by 6.5% for auction charges so as to arrive at the value at factor cost. The auction value of inland fish is doubled to cover the under-reporting on inland fishing as recommended by Kazi Committee in 1986. The estimates are based on annual catch of inland and marine fishing and their respective base year prices. Under the re-basing exercise for fishing, the estimate of fishing cost as 36 percent of total output of marine fishing continued as it was in the

case of old estimates. However, in new estimates 16 percent of land fishing output was also deducted as input cost whereas no such deduction was made in old estimates at 1980-81 base. The input cost at the rate of 16 percent was recommended by the FBS inland fishing survey.

*Forestry:* The forestry is the last sub-sector of agriculture which covers the activities of logging and gathering of uncultivated forest products classified into two large groups:

- major products comprising industrial wood such as timber and firewood.
- minor forest products including a large number of heterogeneous items such as ephedra, grazing, resin, medicinal herbs etc.

In the 1980-81 base methodology, data on public sector forests being used were collected from the Provincial Chief Conservators of Forests, whereas for the private sector forests and non-forests areas, ratio of timber supply as 73% and firewood as 99% of total consumption of the forest output had been applied.

On the other hand, in the new estimates at 1999-00 base, consumption approach has been used for estimating the gross value added of forestry. The consumption of forest output for the household sector is estimated from the Household Integrated Economic Survey (HIES) 1998-99 and industrial use from Census of Manufacturing Industries (CMI) 1995-96 and survey of Small and Household Manufacturing Industries (SHMI) 1996-97. The use of timber in construction is also taken from construction survey 1993-96, adjusted with three years trend. As no inputs have been estimated, the same output is being used as value added.

The estimates of timber have been developed from the consumption side. In this exercise 35% is used as trade and transport margin to convert the purchaser's price into producer's price. 25% is deducted for smuggling. 25% input costs have been taken in respect of timber and firewood. The major user of firewood is household sector. Firewood is also used in large and small scale manufacturing sectors. The

estimates of firewood have been developed from the consumption side taking all possible care of double counting and inline with the recommendations of 1993 SNA.

One of the outputs of forestry and logging consists of the timber felled, prepared into logs and transported by logging establishments to the purchasers of the timber. The gathering of wild berries, fruits, seeds and thatching grass; charcoal burning; and rough-cutting of timber for firewood or building poles are also considered to be forestry activities. Such produce available in Pakistan forests has been included.

### 3.3.2 Industry

The industrial sector comprises of mining and quarrying, manufacturing (large scale, small scale & slaughtering), construction, and electricity, gas & water supply sub-sectors. As mentioned earlier, the slaughtering was a part of livestock in old base estimates; however, in new estimates it has been included in manufacturing as per SNA 1993 recommendations. A detailed description of re-basing of value added in industrial sub-sectors is given below.

*Mining and Quarrying:* In case of mining and quarrying, the Federal Bureau of Statistics has changed the methodology of estimating both the output in this sector and intermediate cost for producing this output in addition to changing base year prices from 1980-81 to 1999-00. Previously, the value addition in the mineral sector was concentrated in three principal minerals, i.e., coal, natural gas and crude oil. These three minerals accounted for about 82% in the total value addition in the mineral sector. To estimate the revised benchmark 1999-00 estimates of value addition, the mining and quarrying sector has been re-classified according to ISIC Revision III and PSIC Revision II[26]. The composing elements of the sector are as under:

- Coal Mining
- Crude Oil Mining
- Natural Gas Mining

[26] ISIC is United Nations' International Standard Industrial Classification and PSIC is Pakistan Standard Industrial Classification.

- Other Minerals
- Surface Minerals
- Allied Services of Minerals Exploration

Product approach is used for estimating the value added in coal, crude oil & natural gas, other minerals and surface minerals while income/cost approach was used to estimate the benchmark value addition in allied services. As regards the intermediate cost, in the 1980-81 base, 20 percent fixed input cost was deducted from the total gross output to arrive at gross value added. Now for the base 1999-00, the separate input cost ratios by mineral items have been calculated which are as 23.92 percent for coal, 23.18 percent for crude oil and natural gas, 21.02 percent for surface minerals, 46.5 percent for allied services and 20.8 percent for other minerals. The gross value added is the balancing item in the production account of SNA 1993. For the revised base estimates gross output is calculated at producer prices for each mineral category and, intermediate cost at purchaser prices. The 1980-81 based GVA estimates were grossly underestimated in crude oil & natural gas and other minerals while the surface mineral and allied services were entirely missing.

*Manufacturing:* The manufacturing that is the largest sub-sector of industry has been divided further in to the following three sub-groups:

- Large-scale Manufacturing
- Small-scale Manufacturing
- Slaughtering

*Large-scale Manufacturing*: The large-scale manufacturing covers the establishments registered under Section 2(j) and 5(i) of the Factories Act, 1934, whereas small-scale manufacturing includes all such manufacturing establishments not covered thereunder. Section 2(j) refers to the factories which employee 20 or more workers on any working day during the year and use power in their manufacturing operation. Section 5(i) pertains to factories wherein a manufacturing process is carried on or ordinarily carried on whether with or without the use of power wherein ten or more workers are working there in or have worked there on any day of the 12 months

immediately preceding. The data on large scale manufacturing establishments is collected through census of manufacturing industries by the joint efforts of Federal Bureau of Statistics, Provincial Directorate of Industries & provincial bureaus of statistics. The census data has been used to derive benchmark estimates. According to SNA 1993, Liquid Petroleum Gas (LPG) is also included in this sub-sector.

As per old base methodology, the 1980-81 benchmark estimates of Large-scale Manufacturing were prepared on the data supplied by 1980-81 (CMI) after adjustment for non-response, under-reporting and under-coverage. However, other reports of CMI prepared later on were not being used subsequently for estimation of annual estimates of value added in respect of large scale manufacturing establishments. The methodology applied in the 1980-81 base estimates of national accounts implicitly assumed that the cost structure had not changed over a period of time, which was not true. Changes in value added from one year to the next may differ from the changes in the gross value of production because of un-appropriate changes in input cost. To overcome this problem, Kazi Committee had specifically recommended for conducting annual survey of selected large scale manufacturing establishments, which is yet to be started. Indirect method was being used to project the year-to-year value added on the basis of Quantum Index of Manufacturing Industries (QIM). Estimates at constant factor cost were converted into current factor cost by applying a specific constructed Wholesale Price Index (manufacturing). In the absence of any reliable data on depreciation, a flat rate of 10% of gross value added is applied to arrive at net value added.

The new benchmark estimates for the year 1999-00, on the other hand, are based on latest CMI 2000-01 as decided by the National Accounts Committee. The data of CMI 2000-01 has been decomposed into two strata i.e. stratum-1 comprised of public limited companies listed / unlisted and stratum-2 others (individual ownership, partnership and private limited companies). The data of stratum-2 has been raised on the basis of ratio of employment reported in CMI 2000-01 to total employment of the frame of LSMI study 1999-00 with adjustments for 2000-01. The data of stratum-1 public limited companies has not been raised but gaps have been filled-in from LSMI study 1999-00.

*Small-scale manufacturing*: In case of small-scale manufacturing industries, there is no change in the methodology in new base estimates except that a new growth rate fixed for every year has now being used. The FBS conducted the latest Small and Household Manufacturing Industries survey 1996-97 which gave the figure for value addition of small-scale industries at Rs. 97,773 million at current factor cost. The same constant factor cost figure was raised by the growth rate of 5.31 for the year 1997-98. The study conducted by Quaidian Economic Consultants, Quaid-i-Azam University, Islamabad in 1999-2000 estimated the growth rates of 6.86 percent and 7.51 percent for the years 1998-99 and 1999-00 respectively which were applied to estimate the benchmark figures for GVA of small scale industries. To compute the value addition for the subsequent years, the fixed growth rate of 7.51 percent has been used as recommended by the study.

*Slaughtering*: According to the latest accounting framework the slaughtering industry relates to manufacturing whereas the livestock is a part of agriculture sector. The products i.e., meat, hides, skins, bones, and blood etc. constitute slaughtering. In order to estimate value addition in slaughtering industry, the FBS takes quantities of beef, mutton and poultry meat from the published Agricultural Statistics of Pakistan. Net sale of animals in the livestock sub-sector is taken as input for slaughtering. Livestock division provides number of animals sold for slaughtering during the year 1999-00 (the new base year). Output consists of meat and byproducts like fats, hides/skins, bones, blood, edible offal etc. The prices of these products have been taken from Marketing & Grading Department. The value added in slaughtering industry has been derived by the product approach. For the estimation of poultry meat, data in terms of quantity and prices of meat have been obtained from the Poultry Research Institute and livestock division. The prices are recorded by the Marketing & Grading Department, Karachi, in some major cities of Pakistan.

*Construction:* This sector covers land and construction of all type of buildings, roads, bridges, railway lines, utility lines (telecommunication lines, power lines, and pipe lines), waterways, dams as well as repairs and maintenance of such infrastructure. The estimates of the sector have been developed on the basis of the expenditure, incurred

by the establishments undertaking the construction or the contractors or the sub-contractors and are also purchasing the material. The data on expenditure on construction of these activities have been obtained form data set of GFCF of all sectors of economy. The data of population census 1998 regarding the number of houses in different categories have been used. The input structure, provided by a study on construction conducted by FBS, has been applied. Gross output has been estimated from the demand side, allowing for estimates of own account construction. The coefficients of the value added components have been used to derive the GVA of all activities of construction separately. The following uses of construction output are identified:

- Gross fixed capital formation originating from construction including:
  - Land improvement
  - Construction of residential and non-residential buildings
  - Other construction (roads, railways, utility lines, airports/runways, dams, pipelines, waterways etc)
- Intermediate use by industries: This relates to repairs and maintenance of non-residential buildings and other physical infrastructure.
- Household final consumption expenditure on repairs and maintenance of dwellings

The total amount of intermediate consumption by branch is also calculated on the basis of findings of the study on construction. In the new base series the katcha building in housing sector and segregation of roads by type have also been added.

*Electricity, Gas and Water Supply*: This sector covers the whole range of electricity generation, transmission & distribution and gas transmission and distribution. Moreover, the new base estimate also covers water works and supply as recommended in SNA 1993. The following is the sub-classification and coverage of the sector:

- Electricity generation, transmission and distribution by public sector agencies (e.g., WAPDA, KESC)

- Independent power plants (IPPs)
- Captive power plants (CPPs)
- Small hydel power units
- Gas transmission and distribution
- Compressed natural gas (CNG)
- Water works & supply

In the new estimates, a number of improvements have been made with respect to all sub-sectors in terms of enhancement in the coverage, estimation methodology and availability of data, as discussed below.

Electricity Sub-Sector**:** Water & Power Development Authority (WAPDA) and the Karachi Electric Supply Corporation (KESC) are the biggest sources of energy generation and distribution. Pakistani as well as multi national companies also work as independent power plants (IPPs) units under the license issued by the government of Pakistan. The IPP units generate electricity and sell the product to WAPDA and KESC, which distribute with their networks. The Small hydel dams/micro hydel projects are situated in NWFP. These units are covered for the first time in the national accounts estimates.

Gas Sub-Sector: The activities in the Gas sub-sector are the transmission and distribution of the natural gas. For the existing estimation the data is collected from Sui Northern Gas (SNG), Sui Southern Gas (SSG) and BOC Gas Companies; these three companies were considered as the sole distributors of the natural gas. Therefore, value addition was computed on the basis of these three companies only. Now Petroleum Gas (LPG) and Compressed Natural Gas (CNG) stations have also been established and operating throughout the country. LPG is included in large scale manufacturing sector but CNG is included in this sub-sector.

Water Supply: For the purpose of GVA estimation, the sector has been divided into three sub-sectors.

- Irrigation Water (Canal and Tube well water)

- Domestic Water
- Commercial/ Industrial Water

The GVA estimates of electricity, gas and water supply have been compiled through product approach. Accordingly gross output/gross sale of energy plus other income have been taken as gross output on basic prices which means transport & trade margins and indirect taxes have been eliminated from the gross output. Intermediate consumption (purchaser prices) has been deducted from gross output to arrive at gross value added at basic prices. The putative formula has been used to compute gross value added: the difference of gross output and intermediate input at producer price.

### 3.3.3 Services

This sector consists of Transport, storage and communications, Wholesale and retail trade and hotels and restaurants, Finance and insurance, Ownership of dwellings, Public administration and defence, and Social, community and private services. Detail of each sub-sector is given below.

*Transport, Storage and Communications*: Transport, storage & communications sector consists of:

- Pakistan railways
- Water transport
- Air transport
- Pipeline transport
- Road transport
- Mechanized
- Non-mechanized
- Communications[27]
- Storage

[27] Email is also a fast spreading mode of communication; however, there are no guidelines available to estimate its contribution to the gross domestic product of a particular region. It could be another satellite account which requires attention of national accountants in their future research.

The transport sector includes passengers and freight transport, whether scheduled or unscheduled by rail, road, water or air including all auxiliary activities such as terminal and parking facilities, cargo handling, storage, besides postal and telecommunication activities. To prepare the estimates on transport and communications in accordance with latest accounting framework and on new base of 1999-00, a study was conducted by FBS on intra-city road transport, freight container services, travel agencies, courier services and inland water transport. Tour operators and travel agents sector was also covered through study. Data regarding courier activities have been provided by the source agencies. Inter and intra city transport has been finalized with National Transport Research Centre (NTRC) experts. A small survey was conducted to determine GVA per boat and the findings have been applied to the inland water transport sector. Un-registered part of non-mechanized road transport has been adjusted according to the number of animals of respective categories.

*Wholesale & Retail Trade and Hotels & Restaurants:* The activities included in this sector are:

- Wholesale and retail trade including imports
- Purchase & sale agents and brokers
- Auctioning

In the old base methodology (of 1980-81), the estimates of national accounts of Pakistan were computed by applying commodity flow method. In 1980-81 benchmark estimates, SNA 1953 (and to some extent SNA 1968) were followed, where the output of wholesale and retail trade was measured by the value of trade margins realized on goods purchased for resale. The flows of domestic products and imported goods provided information on marketed portion of various commodities domestically produced and imported. The trade mark-ups separately for agricultural commodities, manufactured items and imported goods have been derived from various surveys and studies. The major difficulty with this sector was the lack of disaggregation. Wholesale and retail activities were rarely estimated separately. Ratios of trade margins and marketed surplus remained constant since two decades. The gross

margins used in the 1980-81 base series of national accounts were estimated on the basis of different inquiries.

For re-estimating the value added of this sector at new base, a study on wholesale and retail trade was conducted through which trade margins and marketable surplus by commodity was computed which have been used as new benchmark (with base year 1999-00). Regarding the hotel and restaurant sub-sector, the study treated hotels and restaurants as separate strata and provided new benchmark estimates for value addition by these services.

*Finance and Insurance:* This sector consists of State Bank of Pakistan, Other depository corporations and financial intermediaries, insurance corporations and pension funds. The approach used for obtaining new base estimates of gross value addition by these institutions has been described below:[28]

State Bank of Pakistan: This sub-sector consists of the central bank. The data on different components of output, inputs, wages & salaries, deprecation and GFCF has been collected from the State Bank of Pakistan. The gross value added of State Bank of Pakistan has been compiled using production approach for the year 1999-00. Intermediate consumption includes the value of all the goods or services used as inputs into subservient activities such as purchasing, sales marketing, accounting, data processing, transportation, storage, maintenance, security etc.

Other Depository Corporations: This sub-sector consists of deposit money corporations and others. The deposit money corporations consist of nationalized Pakistani banks, private domestic commercial banks, specialized banks and foreign commercial banks. The others consist of cooperative banks, development financial institutions, investment banks and leasing companies. The requisite data have been obtained from concerned banks which consist of

[28] The SNA 1993 recommends using financial intermediation services indirectly measured (FISIM) by which a difference between interests received from different sectors of the economy and interest paid to different entities/individuals is used for estimated value added of financial institutions. However, this approach needs a large set of data that are currently not available in Pakistan.

output, intermediate cost, wages & salaries, depreciation and gross fixed capital formation for the year 1999-00.

Other Financial Intermediaries: The institutions included in other financial intermediaries are discount & guarantee houses, housing finance companies, venture capital companies, investment companies, modaraba companies, exchange companies (money changers) and mutual fund companies etc. Mostly these companies in Pakistan are privately operated. The data has been collected on questionnaires through mail enquiry and from the annual reports of the institutions.

Insurance Corporations and Pension Funds: Insurance companies are generally incorporated, entities, and provide life, accident, sickness, fire, casualty or other forms of insurance. Data regarding the balance sheet, the revenue and profit and loss accounts available from the annual reports of the insurance companies coupled with data collected through questionnaire have been used for preparation of the GVA. The estimates of GVA of employees' old-age benefit institution have also been included first time. The gross value added has been calculated adding wages & salaries and depreciation, because this institution is working on no-profit/no-loss basis as a welfare government department.

The data of discount & guarantee houses, venture capital, investment companies, exchange companies, Postal Life Insurance Company and employees' old-age benefit institutions have been compiled first time in new base estimates.

*Ownership of Dwellings:* The estimates of value added in this sector by old methodology were measured by the rent accruing from ownership of dwellings, rented as well as self-occupied. This required cumulative increase of houses and their respective rent. The numbers of occupied houses in urban and rural areas had been taken from the Housing Census, 1980. The estimates of annual average rentals for urban areas were derived form the rent survey of 45 urban towns conducted by FBS. As no survey was conducted in the rural areas the rentals for rural areas had been

taken from the Household Income & Expenditure Survey, 1984-85 that were deflated for benchmark year, 1980-81, on the basis of the changes in urban rent survey results. A deduction of 37.5% for rural and 22.5% for urban, as per practice followed by Excise & Taxation Department, was made from gross rentals to account for repairs and maintenance. To compute the value added estimates for subsequent years, inter-census housing growth separately for urban and rural areas had been applied to the number of dwellings in the benchmark. Average monthly rent for urban areas separately for each year was taken from FBS rent survey. In case of rural areas, rent had been derived as percentage of urban rent. The value added so derived for the years 1980-81 onward is at current prices, which had been deflated by rent index to arrive at constant prices. Due to non-availability of rents after 1985-86, the constant estimates were projected on a constant growth rate of 5.29%.

The new base estimates also have been based on the above methodology, i.e., value added are measured by the rent accruing form ownership of dwellings, occupied. However, the requisite information for estimating new benchmark have been obtained from latest Housing Census, 1998. The estimates of annual average rentals for urban and rural areas have been derived from the rent survey of 1998 conducted by FBS. The intermediate consumption by the type of houses has been estimated through survey undertaken by National Accounts in August 2002. For the subsequent years, the GVA at constant cost will be estimated on the basis of extrapolation of base year estimation by the growth of incremental houses.

*Public Administration & Defence:* National Accounts estimates on general government cover budgetary data of the federal government defence services, provincial government, district governments, tehsil and municipal administrations and cantonment boards documents. 1980-81 based estimate of the value added in Public Admin & Defence consisted of three components:

- The emoluments of the government employees compiled from the budgets of federal, provincial and local governments, which are subsequently revised on the basis of the revised estimates, published in the subsequent budget.

- Rent of the government owned and occupied buildings were assumed to be 10 percent of the wage bill.
- The rate of depreciation was assumed to be 5 percent of the aggregate of the wage bill and imputed rent.

On the basis of reclassification made on the lines of SNA 1993, uniform and liveries, bonus and cash awards for meritorious services, not included previously, have been valued in the wages and salaries estimates. Besides, depreciation at 5% of fixed assets has been added to workout gross value addition of the sector.

*Social, Community and Private Services:* Income arising in the social, community and personal services consists of income of persons engaged in private education, medical & health services and other household and community services. Expenditure approach has been applied to estimate the contribution of services sector in national economy which involves collection of data on number of service establishments classified by type of service and data on components of value added (value of sales and services, cost incurred during the process of rendering services, wages paid to the employees, operating surplus etc) and gross fixed capital formation.

FBS had carried out a number of surveys of important service establishments namely educational institutions, medical & health, advertising, accounting, auditing & book keeping and recreational services in the benchmark year 1980-81 which provided valuable data on various components on per worker value added. The number of persons employed in services sector by occupational group had been derived from the tabulation of Population Census 1981. The two components provide the basis for computation of value added estimates for the benchmark year. For subsequent years annual average compound growth rate of per worker wage is applied. An allowance of 15% for under reporting has been added in the gross value added. CPI General is used as deflator to derive estimates at current factor cost. An account of 5% is made to account for depreciation.

For revised base estimates new services have also been covered, like: Hardware, software and computer based information technology (IT) services which consist of

mainly in designing customized software. A large number of computer programmers, hardware and software engineers are engaged in this activity. The frame of Pakistan Software and Hardware Association (PASHA) was used.[29] A study was also conducted by FBS which estimated value addition by activities such as legal, accounting, bookkeeping and auditing activities, tax consultancy, market research and public opinion polling, business and management consultancy architectural and engineering activities and related technical consultancy, private investigation and security activities etc. Also included in this base are the activities of education, private general and specialized hospitals, sanatoria, preventoria, rehabilitation centres, leprosaria, dental centres and other health institutions that have accommodation facilities. The record of Pakistan Medical and Dental Council is the source. National Council for Tibb and Pakistan Homeopathic Medical Council are the sources for other health activities. For the social work with and without accommodation activities, a number of orphan houses, committees, commissions, trusts, welfare organizations and NGOs providing services in one or more of the activities were covered. Activities of business, employers and professional organizations, chambers of commerce and industry, trade unions, private cooperative societies registered with Registrar Cooperative Societies have also been covered. The estimates include Writers Forum and Gilds, unions of journalists, associations of medical professionals, photographers, barbers, launders, real estate agents, insurance agents, clerks etc. Recreational, cultural and sporting activities and other activities have also been covered in new base estimates which were earlier ignored.

Thus it is clear from the above discussion that the recent rebasing of national accounts of Pakistan (from base year 1980-81 to 1999-00) is not just re-pricing of the economic activities but there is also expansion in coverage and improvements in method of estimation. This is an additional reason why simple splicing may render inappropriate results for estimation of national accounts for past years, prior to 1999-00. In the next chapter, a detailed methodology is given to estimate a consistent series of national accounts for past years.

[29] There is also a large number of small and informal IT practitioners involved in both hardware and software solutions. These are spread all over the country including small cities and are outside the PASHA frame. A comprehensive study or survey is needed to estimate the value addition generated by these units.

**Box 3.1: Impact of Changes in Relative Prices**

Let ***Z*** be an aggregate of national accounts with two components ***X*** and ***Y*** such that $Z_{at} = p_a X_t + q_a Y_t$ or $Z_{at} = q_a \left[ r_a X_t + Y_t \right]$ for year *t* valued at prices of base year *a*; $p_a$ and $q_a$ are base year prices of *X* and *Y* respectively and $r_a = \frac{p_a}{q_a}$ is relative price of *X* in base year *a*. Suppose the base year is changed from *a* to *b*. Thus the value of *Z* at new base is: $Z_{bt} = q_b \left[ r_b X_t + Y_t \right]$ while $r_b$ is relative price of $X_t$ in base year *b* and $q_b$ is price of $Y_t$ in the base year *b*. Let we have to convert an old value of *Z* for a year say *t*-1 to new base by splicing with the following splicing factor:

$$s = \frac{Z_{bt}}{Z_{at}} = \frac{q_b \left[ r_b X_t + Y_t \right]}{q_a \left[ r_a X_t + Y_t \right]} = \left( \frac{q_b}{q_a} \right) R \text{, where } R = \frac{r_b X_t + Y_t}{r_a X_t + Y_t}$$

We know the value of *Z* for year *t*-1 at prices of old base year *a*; i.e. $Z_{at-1} = q_a \left[ r_a X_{t-1} + Y_{t-1} \right]$ and wish to know the new value at prices of the base year *b* that should be:

$$Z_{bt-1} = q_b \left[ r_b X_{t-1} + Y_{t-1} \right]$$

By splicing we have an estimate of $Z_{bt\text{-}1}$ as below:

$$\hat{Z}_{bt-1} = s.Z_{at-1} = \left( \frac{q_b}{q_a} \right).R.q_a \left[ r_a X_{t-1} + Y_{t-1} \right] = q_b.R.\left[ r_a X_{t-1} + Y_{t-1} \right]$$

It can easily be seen that $\hat{Z}_{bt-1} = Z_{bt-1}$ only if $r_a = r_b$, i.e. the relative prices in two base years are the same. However, in case of rebasing of national accounts in Pakistan, the relative prices have changed significantly as there is a space of twenty year between the two bases. Thus splicing method is less likely to give accurate results, and should be used with utmost care especially when dealing with the composite variables or aggregates.

# 4 Estimating Past Data of National Accounts at New Base

As described in the previous chapter, the Federal Bureau of Statistics has not only changed the base of the national income accounts of Pakistan but also has changed the methodology of measuring value added of a number of sectors of the economy. Although it has been publishing new base accounts for the period starting from 1999-00 onward, neither has it released the rebased past series of national accounts, nor any volume and price indices are available that can be used to chain link the past data with new series. An attempt has been made in this chapter to re-estimate the past series of national accounts at new base year prices and consistent with the new methodology adopted by the FBS. In the subsequent sections, techniques in detail for estimating the series of sub-sectors of agriculture, industry and services sectors at new base of 1999-00 have been described along with discussion on data issues[30].

## 4.1 Agriculture

There are four sub-sectors included in the agriculture sector, viz., crops (major and minor crops), livestock, fishery and forestry. The gross value added of these sub-sectors has been estimated by product approach. We have used the same methodology as adopted by FBS. However, in some cases, where detailed information was not available, we have resorted to certain proxies or some realistic assumptions.[31]

### 4.1.1 Major crops

There is no difference in terms of coverage of crops in the old (1980-81) and the new (1999-00) methodologies; both treat the twelve crops as major crops which are rice, wheat, barley, jowar, bajra, maize, gram, cotton, sugarcane, rapeseed & mustard, sesamum, and tobacco. The new estimates have been made by applying 1999-00 prices as base prices on the quantity of respective crops. The value added of major

[30] Although we have made some improvements over FBS estimates of value added in some sub-sectors, the coverage of economic activities remains the same as by FBS. Thus the new series also underestimates the actual size of the economy in Pakistan. There is a need to document the informal sector by more efforts on the part of FBS in collecting primary data.

[31] It may be noted that use of proxies and assumptions is not uncommon in national accounts compilation; FBS also uses proxies in estimating value added of different sectors as mentioned subsequently in relevant sections.

crops at new base is 360 percent higher than that at old base of 1980-81; this is primarily due to price changes, the impact of quantity changes is only 11 percent. The dominance of price impact has stemmed from significant increase in prices of crops; e.g., wheat prices has increased by 470 percent in 1999-00 over that in 1980-81, cotton price increased by 150 percent during this period, prices of rice and sugarcane increased by 330 percent and 270 percent respectively. The impact of quantity changes came from revised assumptions about by-products and improvements in measuring inputs; the basic data of crops production is the same in both the methodologies as reported in Agriculture Statistics of Pakistan.

The basic data of crops production (province wise) have been obtained from Agriculture Statistics of Pakistan and the following procedure has been followed to make the old series of value added in major crops consistent with the new methodology.

Output value of major crops at constant prices of 1999-00 is given below.

$$Y_t = \sum_{j=1}^{12} \left( P_{j0} \cdot Q_{jt} \right) + \sum_{j=1}^{12} \left( \breve{P}_{j0} \cdot b_j Q_{jt} \right) \qquad (4.1)$$

$Y_t$ = gross output value of major crops in year $t$

$Q_{jt}$ = physical output of crop $j$ in year $t$

$P_{j0}$ = base year (1999-00) price of crop $j$

$\breve{P}_{j0}$ = base year (1999-00) price of by-product of crop $j$

$b_j$ = ratio of by-product to principal crop $j$

The physical output of each crop has been taken from various issues of Agricultural Statistics of Pakistan and base year prices have been taken from Rebasing Book published by FBS (FBS, 2004). The ratios of by-products to principal crops have also been reported in the Rebasing Book. In order to work out value added, the input cost valued at 1999-00 prices is needed. The input of crops sector is classified into

different heads; the overall estimate of each of it is then bifurcated into major and minor crops as given in Table 4.1.

**Table 4.1 Distribution of Inputs into Major and Minor Crops**

| Input Heads | %Share of | |
|---|---|---|
| | major crops | minor crops |
| Overall | 78 | 22 |
| Seed | 85 | 15 |
| Fertilizer | 75 | 25 |
| Pesticides & insecticides | 76 | 24 |
| Water | 73 | 27 |
| Ploughing, planking & sowing | 81 | 19 |
| Transport charges | 77 | 23 |
| Wastage | 74 | 26 |

Source: FBS (2004)

Two types of changes may have occurred in the value of inputs measured in new methodology viz., changes in prices and changes in quantity measurement. The changes in prices are obvious as base year has been changed from 1980-81 to 1999-00. Although changes in quantity measurement may be less obvious, in reality there are differences in measurement as reported by FBS (2004). The detailed information to estimate the values of all the inputs according to new methodology is not available; however, the total value of inputs for years starting from 1980-81 to 1994-95 is available in FBS publication on national accounts (FBS 1995). The following technique has been used to adjust the old series of inputs for both the price and quantity changes[32] (see Box 4.1 for a description of adjustment technique).[33]

$$N_{it} = A_i \cdot B_i \cdot \widetilde{N}_{it} \qquad (4.2)$$

with $A_i = p_{i0} / \widetilde{p}_{i0}$ , and $B_i = \left(q_i / \widetilde{q}_i\right)_{99-00}$

$N_{it}$ = value of input *i* as per new methodology (at new base price) in year *t*

$\widetilde{N}_{it}$ = value of input *i* as per old methodology (at old base price) in year *t*

$A_i$ = adjustment factor for prices of input *i*; which is the ratio of new base price ( $p_{i0}$ ) to old base price ( $\widetilde{p}_{i0}$ )

$B_i$ = adjustment factor for quantity of input *i*; which is the ratio of quantity during 1999-00 measured by new methodology ($q_{i,99\text{-}00}$) to the same measured by old methodology ( $\widetilde{q}_{i,99-00}$ )

[32] The old series of input for years 1995-96 onward has been estimated through extrapolation.

[33] This technique gives reliable results in case of a singular variable. In a composite variable case, it can be used if there is no change in relative prices and quantity weights of its components.

Given (4.1) and (4.2), the value added of major crops as per new methodology at constant prices of 1999-00 can be measured as follows.

$$V_t = Y_t - \sum_i g_i \cdot N_{it} \qquad (4.3)$$

Where $g_i$ is the share of major crops in input $i$ (as given in Table 4.1).

Value added of major crops at current prices according to the new methodology has been worked out by applying major crops deflator on its values at constant prices (as done by FBS); the deflator has been constructed on the basis of wholesale price index[34] of each individual crop[35] as described below.

$$P_{kt} = \sum_j w_{jt} \cdot P_{jkt} \qquad (4.4)$$

$$P_t = \frac{1}{4}\sum_k P_{kt}$$

$P_{kt}$ is quarterly deflator and $P_t$ is annual deflator of major crops; $P_{jkt}$ is quarterly wholesale price index of crop $j$ and $w_{jt}$ is share of crop $j$ in total output in year $t$. The annual value added at current prices ($\hat{V}_t$) has then been worked out as follows.

$$\hat{V}_t = P_t \cdot V_t \qquad (4.5)$$

### 4.1.2 Minor crops

In the new methodology the coverage of minor crops has been increased by including a number of crops which were absent in the old estimates. The past data for all the new crops are not available in published sources; however, the crops for which the data are available have the dominant share in new estimates (more than 90 percent). Thus the new series of gross value added of minor crops has been estimated by

[34] FBS is now using producer price index; however such an index is not available for past years. However, the use of WPI will not affect the results very much as the movements in the two indices of an individual crop are expected to be similar.

[35] The wholesale price index of sesamum is not available, so wholesale price index (general) has been used for it.

focusing on these crops.[36] The value of other crops has been estimated on pro rata basis, i.e. the output value of included crops at new base has been blown up by the share of additional minor crops in overall value during 1999-00. Thus the gross value of output of minor crops at new base prices is the following.

$$Y_t = \frac{1}{1-\alpha}\left(\sum_j P_{j0} \cdot Q_{jt}\right) \qquad (4.6)$$

$Y_t$ = gross output value of minor crops in year $t$

$Q_{jt}$ = physical output of crop $j$ in year $t$ ($j$ = 1 to 18)

$P_{j0}$ = base year (1999-00) price of crop $j$

$\alpha$ = share of additional minor crops in total value added during 1999-00.

The value of different inputs has been estimated by using the share of minor crops in total inputs as estimated in section 4.1.2. Thus the value added of minor crops at constant prices of 1999-00 has been worked out as follows.

$$V_t = Y_t - \sum_i (1-g_i) \cdot N_{it} \qquad (4.7)$$

Value added of minor crops at current prices has been worked out by applying minor crops deflator on its values at constant prices (as done by FBS); the deflator has been constructed on the basis of wholesale price index of each individual crop[37] by following the same technique as used for major crops.

### 4.1.3 Livestock

In the new methodology, natural growth and net sales of animals have been included for the first time in the livestock sector, while the slaughtering that was earlier covered under livestock has now been moved to manufacturing sector. Thus the new estimates of gross value added in livestock include the following items.

[36] The crops included in the exercise are mash, masoor, mung, mattar, other pulses, tomato, potato, other vegetables, groundnuts, soybean, sunflower, safflower, canola, linseed, castroseed, mango, banana, apple, citrus fruits, dates, guava, apricot, peach, pears, plums, grapes, pomegranate, almonds, chillies, onion, garlic, turmeric, ginger, gouarseeds, fodder crops, and sugarbeet,

[37] The wholesale price index of some minor crops is not available, so wholesale price index (general) has been used for them.

1. Natural growth of animals
2. Net sales
3. Milk production
4. Draught power
5. Dung & urine
6. Wool & hair
7. Poultry

The methodology used to estimate the gross output value under above heads is discussed below.

*1. Natural Growth:*

Natural growth is worked out by multiplying the base year prices of animal to the number of animals below 1 year age. The animals included are cattle, buffaloes, sheep, goats, camels, horses, asses and mules. The base year prices have been obtained from the Rebasing Book and the population of animals from four livestock censuses in 1972, 1976, 1986 and 1996; and interpolated the census figures for inter-census years. Here it is not out of place to mention that the time series of the population of different animals and their sub-categories as estimated by this study are different to the estimates of Ministry of Food, Agriculture and Livestock (MinFAL) as reported in Agricultural Statistics of Pakistan. The MinFAL series of livestock population has sudden jumps in different years and they show such trends in certain kinds of animal that are not consistent with general observations (see Annexure B for detailed description of problems with MinFAL estimates and an account of the approach adopted in this study).

*2. Net Sales:*

The gross value of net sales has been worked out as product of base year prices of adult animals and number of animals sold for slaughtering. The number of animals sold for slaughtering in a year ($t$) has been calculated as follows:[38]

[38] This formula assumes that there is no natural death of animals, which is not very strong as usually animals are slaughtered when there is a fear of their death.

$S_{it} = L_{it-1} + N_{it} - L_{it}$ (4.8)

$S_{it}$ = number of slaughtered animals of kind *i* in year *t*

$L_{it}$ = total number of animals of kind *i* in year *t*

$N_{it}$ = number of New born animals of kind *i* in year *t*.

The kinds of animals included in the estimates of Net sales are cattle, buffaloes, sheep, goats and camels. The base year prices for these animals have been taken from the Rebasing Book.

*3. Milk Production:*

The total value of milk production has been estimated according to the technique used by FBS as given in Table 4.2 (for 1999-00). The gross output of milk for the national accounts is that part of milk production which is used as human consumption. A formal representation of this technique is given below.

$$Y_t = \sum_i \left( u_i \cdot P_{ui}^o C_{it} + (1 - u_i) \cdot P_{ri}^o C_{it} \right) \quad (4.9)$$

$$C_{it} = c_i \cdot m_i \cdot M_{it}$$

$Y_t$ = gross output of milk

$u_i$ = share of urban areas in total consumption of milk of animal *i*; *1-*$u_i$ is that of rural areas

$P_{ui}^o$ = base year price of milk of animal *i* in urban areas

$P_{ri}^o$ = base year price of milk of animal *i* in rural areas

$C_{it}$ = Total consumption of milk of animal *i*.

$c_i$ = ratio of milk consumption to production from $i^{th}$ animal

$m_i$ = production of milk per animal *i*

$M_{it}$ = number of milch animal *i* in year *t*

*i* stands for kind of milk animal, i.e., cow, buffalo, sheep, goat and camel.

The parameters $m_i$ and $c_i$, have been worked out from annual data of milk production and consumption reported in Agricultural Statistics of Pakistan.

| Table 4.2 Estimation of Gross Output Value of Milk (for 1999-00) | | | | | |
|---|---|---|---|---|---|
| | **Cows** | **Buffaloes** | **Sheep** | **Goats** | **Camels** |
| Number of milch animals (000 #) | 6815 | 8733 | 13595 | 25755 | 297.5 |
| Milk production (000 ton liter) | 10049 | 21138 | 679.75 | 2575.5 | 1334.68 |
| Production/animal ($m_i$) | 1.47 | 2.42 | 0.05 | 0.10 | 4.49 |
| Milk consumption (000 ton liter) | 8039.2 | 16910.4 | 30.6 | 585.9 | 667.3 |
| Consumption / production ($c_i$) | 0.8 | 0.8 | 0.045 | 0.2275 | 0.5 |
| Urban consumption ($\alpha_i = 0.25$) | 2009.8 | 4227.6 | | | |
| Price (Rs/ton) | 15672 | 16413 | | | |
| Value (Rs million) | 31498 | 69388 | | | |
| Rural consumption (0.75) | 6029.4 | 12682.8 | 30.6 | 585.9 | 667.3 |
| Price (Rs/ton) | 9000 | 9000 | 9000 | 9000 | 5000 |
| Value (Rs million) | 54265 | 114145 | 275 | 5273 | 3337 |
| Total Value | 85762 | 183533 | 275 | 5273 | 3337 |
| Grand Total – all animals combined (Rs million) | | | 278,180 | | |
| Source: Rebasing Book | | | | | |

*4. Draught Power:*

The output value of draught power is based on the number of work animals in a given year and assumed contribution of an animal in ploughing. Table 4.3 gives the technique of benchmark estimate of draught power used by FBS; the same has been replicated for all previous years.

| Table 4.3 Benchmark Estimates of Draught Power | | | |
|---|---|---|---|
| | **Bulls** | **Bullocks** | |
| Number of work animals (000) | 3651 | 182 | |
| 1% for road transport | 36.51 | 1.82 | |
| 2% for brick movements | 73.02 | 3.64 | |
| Number of Animal available | 3541.47 | 176.54 | |
| Number of days in a year | 365 | 365 | |
| off work days (rain, slack season) | 115 | 115 | |
| Number of days available | 250 | 250 | |
| Labour charges (rupees): | | | 21000 |
| - in kind 19500 | | | |
| [65 mund wheat; @Rs300 per mund] | | | |
| - others 1500 | | | |
| Labour charges per day (21000/365) – approx. | | | 60 |
| Tractor charges per day for plough 1/2 acres | | | 70 |
| The same work is done by 1 labour + two animals in half a day; thus if Tractor is replaced by draught power then; | | | |
| Labour charges for half a day | | | 30 |
| Animal charges ( 2 animals) per day | | | 40 |
| Animal charges ( 1 animals) per day | | | 20 |
| Value of draught power per day = animal charges | 20 | 20 | |
| Value of draught power per animal per annum | 5000 | 5000 | |
| Total draught power ( # of work animal * 5000) | 17707 | 883 | 18590 |
| Source: Rebasing Book (FBS 2004) | | | |

*5. Dung & Urine*

For value of dung and urine also we have followed the FBS methodology. There are different ratios of dung & urine for adult and young animals as given in Table 4.4.

*6. Wool & hair*

In case of wool and hair also the FBS methodology has been used. The technique of benchmark estimates has been given in the Table 4.5 which has been replicated for all the previous years.

**Table 4.4 Technique for Benchmark Estimate of Gross Output Value of Dung & Urine**

| | | Number of animals (000) | Wet dung per animal (Kg) | Dry dung per animal (Kg) | Price of dry dung (Rs / ton) | Produced wet dung | Produced dry dung | Gross output (Rs mln) |
|---|---|---|---|---|---|---|---|---|
| Buffaloes | A | 14059 | 28 | 6.75 | 250 | 143683 | 34638 | 8659 |
| | Y | 8610 | 14 | 3.5 | 250 | 43997 | 10999 | 2750 |
| Cattle | A | 14750 | 24 | 6 | 250 | 129210 | 32303 | 8076 |
| | Y | 7254 | 12 | 3 | 250 | 31773 | 7943 | 1986 |
| Sheep | A | 17084 | 2 | 1.2 | 250 | 12471 | 7483 | 1871 |
| | Y | 7000 | 1 | 0.45 | 250 | 2555 | 1150 | 287 |
| Goat | A | 31765 | 1 | 0.6 | 250 | 11594 | 11594 | 2899 |
| | Y | 15661 | 1 | 0.6 | 250 | 5716 | 3430 | 857 |
| Camel | A | 595 | 20 | 5 | 250 | 4344 | 1086 | 271 |
| | Y | 180 | 10 | 2.5 | 250 | 657 | 164 | 41 |
| **Total** | | **116958** | | | | **386000** | **110789** | **27697** |

A = adult; Y= young; Source: Rebasing Book (FBS 2004)

**Table 4.5 Technique for Benchmark Estimate of Gross Output Value of Wool & Hair**

| | # of animals (000) | Wool per animal (Kg) | Hairs per animal (Kg) | Average price of wool (Rs/Kg) | Average price of hairs (Rs/Kg) | Production of wool (ton) | Production of hairs (ton) | Value of Wool (Rs mln) | Value of hairs (Rs mln) | Total value (Rs mln) |
|---|---|---|---|---|---|---|---|---|---|---|
| Sheep | 17084 | 2.3 | | 26 | | 38920 | | 1011.9 | | 1012 |
| Goats | 31765 | | 0.6 | | 25 | | 18000 | | 450 | 450 |
| Camels | 595 | 2 | | 26 | | 1190 | | 30.9 | | 31 |
| Horses | 270 | | 0.8 | | 25 | | 216 | | 5.4 | 5 |
| Mules | 146 | | 0.8 | | 25 | | 116.8 | | 2.9 | 3 |
| **Total** | **49860** | | | | | **40110** | **18332.8** | **1042.9** | **458.3** | **1501** |

Source: Rebasing Book (FBS 2004)

*7. Poultry*

The gross output value has been estimated by splicing, i.e., projecting benchmark estimates backward by applying growth rates of old series. In the new methodology, the value of different types of poultry products like broilers, layers, breeders, desi poultry, etc., have been estimated separately for which past data are not available.

However, the new estimates of poultry value added at prices of 1999-00 (Rs 27.4 bln) are very close to the old estimates at the same year price (Rs 27.8 bln) which implies there is no significant difference in the overall quantity of poultry products measured by the two methodologies. Moreover, the relative prices of different kinds of poultry products are unlikely to change significantly, so the splicing method for this case may give us reasonably good estimates.

The gross value added of livestock at constant prices has been estimated by deducting livestock inputs from total gross value of outputs as estimated above. The input has been estimated by using the input-to-output ratios in the benchmark estimates.[39] As given in the Rebasing Book, the poultry input cost is 36.2% of gross output value of poultry; and for other items, the input cost is 21.2% of their output values.

The gross value added of livestock as estimated above is at constant prices of 1999-00; it has been converted into current prices by using wholesale price index. We have applied wholesale price indices of milk, eggs and chickens for output value of milk, eggs and chickens; and wholesale price index of meat for all other items.[40]

### 4.1.4 Fishing

Fishing includes inland fishing and marine fishing. The estimates at old and new methodologies are different on account of input costs. Earlier no input costs had been deducted from inland fishing, whereas 16 percent of output value is now being deducted as input cost in the new methodology. In case of marine fishing, 6.5% of output value is now being deducted as auction charges in order to arrive at the value at factor cost. Moreover 36% of the output value at factor cost continues to be deducted as input cost. Taking into account such methodological changes, the estimates of fishing value added for past years at prices of 1999-00 have been made as follows.

[39] The same ratio is taken for all years as price indices of output and input may move together and there may not be very significant changes in feeding or other inputs patterns of livestock.

[40] The constant prices estimates of all the sub-sectors of the GDP have been converted into annual and quarterly estimates at current prices by using the same approach as used for major and minor crops; the approach consists of 4 steps: (i) get (or construct) a relevant deflator on quarterly basis, (ii) make annual deflator as average of quarterly deflator, (iii) convert quarterly and annual value added at constant prices into those at current prices by using relevant deflator, and (iv) adjust quarterly series to maintain additivity.

$$V_t = \left(2 \times Q_t \times 34.75 \times 0.84\right) + \left(M_t \times 16.43 \times 0.64 \times 0.935\right)^{41} \quad (4.10)$$

$V_t$ = value added of fishing at constant prices of 1999-00

$Q_t$ = quantity of inland fish caught

$M_t$ = quantity of marine fish cost

Data of inland and marine fish catching have been obtained from Agricultural Statistics of Pakistan. The base year prices and ratios for input costs have been taken from the Rebasing Book. The value added at current prices has been be estimated by applying wholesale price index of fish on constant price value added.

### 4.1.5 Forestry

The forestry includes value added of timber, firewood and minor forest products. We have taken benchmark estimates of the three components from the Rebasing Book and retained their respective old growth rates for estimating gross output value in past years at 1999-00 prices.[42] The value added has been estimated by deducting 25% of timber and firewood from gross output value (as done by FBS). These estimates are at constant prices, have been converted into current prices on the basis of wholesale price indices of timber and firewood.[43]

## 4.2 Industry

The industrial sector consists of four sub-sectors including mining & quarrying, manufacturing, construction, and electricity, gas, and water supply. The manufacturing sector has been further disaggregated into large-scale manufacturing, small-scale manufacturing and slaughtering. The slaughtering is the new addition as a separate sub-sector in recent estimates of national income accounts; earlier it was part of livestock. The value added of industrial sector has been estimated through product approach. A detail description of each sub-sector is given below.

---

[41] 34.75 and 16.43 are base years prices of inland and marine fish respectively in rupees/kg. The quantity of inland fish is doubled in these calculations to adjust underreporting (of 100 percent).

[42] Both the old and new methodologies uses quantum index numbers of forest components for estimating forestry value added for years other than benchmark.

[43] For this purpose a composite index has been constructed on the basis of individual indices of timber and firewood and their respective shares in value added as weights.

### 4.2.1 Mining and quarrying

The new estimates of the value added of mining and quarrying at 1999-00 prices are based on three principal minerals, i.e., coal, natural gas and crude oil and more than thirty other minerals. The past data set of mining output is available only for 24 items (including coal, gas and crude oil) in the Statistical Year Book. The data are province-wise and constitute 88% of the new estimates of the output value of mining and quarrying. We have estimated the past series of output value of this sector on the basis of these 24 items and their respective base year prices; the value of the rest of the items has been estimated on pro rata basis. The new estimates also cover allied services and exploration (AS & E) and surface mineral like bajri, ordinary sand, etc., past information for which is not available in published sources. We have, therefore, used fixed ratios worked out from benchmark data. The value added has been estimated by deducting input costs from output; we have used the same input-to-output ratio as used by FBS (Table 4.6). It may be noted that in new estimates, input ratios are different for different types of minerals while in the old methodology, 20 percent input cost was deducted for all minerals.

**Table 4.6 Intermediate Inputs as % of Output of Minerals**

| Minerals | Old base (1980-81 | New base (1999-00) |
|---|---|---|
| Coal | 20 | 23.91 |
| Crude oil & Natural gas | 20 | 12.78 |
| Surface minerals | Not covered | 21.00 |
| Allied services | Not covered | 46.50 |
| Other minerals | 20 | 20.75 |

Source: Rebasing Book

The value added at constant prices of 1999-00 has been converted at current prices by using a composite wholesale price index of coal and natural gas; the index has been worked out on the basis of individual wholesale price indices of coal and natural gas and their weights.[44] The weights of coal ($W_c$) and gas ($W_g$) have been worked out as follows:

$$W_c = \frac{S_c}{S_c + S_g} \qquad (4.11)$$

$$W_g = 1 - W_c$$

[44] The wholesale price index of crude oil is not available; the indices for diesel oil, motor spirit, etc., are available but only for last three to four years; this is why we used coal and gas indices only.

$S_c$ and $S_g$ are respective shares of coal and gas in total mining output.

### 4.2.2 Manufacturing

In new methodology, manufacturing consists of three sub-sectors:

i. Large-scale manufacturing
ii. Small-scale manufacturing
iii. Slaughtering

*i) Large-scale manufacturing*

The new estimates of value added for years 1999-00 onward has been made on the basis of new benchmark value for the base year and new weights for different industries in quantum index of large-scale manufacturing. The weights are based on latest census of manufacturing industries (CMI), i.e. 2000-01. For the purpose of estimating past series, this study has worked out a new series of the quantum index of large-scale manufacturing on the basis of industry-wise production data as reported in various issues of Monthly Statistical Bulletin of FBS. The available set of weights are for 1980-81 and 1999-00; for the period prior to 1990, 1980-81 weights have been used and for the period from 1990 onward, the new weights of 1999-00 have been used. The index number thus conducted has then been used in turn to estimate value added at new base by applying its growth backward on new benchmark estimates of LSM, i.e.:

$$LSM_t = \prod_{i=t}^{-1} (1 + g_{t-i})^{-1} \cdot LSM_0 \qquad (4.12)$$

$LSM_0$ = benchmark estimates of value added at new base in year 1999-00

$LSM_t$ = value added at new base in year $t$ (earlier than 1999-00)

$g_t$ = growth rate of quantum index of manufacturing (1999-00=100)

$t$ ranges from -27 to -1 such that -27 is year 1970-71 and -1 is year 1998-99.

We have applied wholesale price index of manufacturing to convert constant price estimates into current price estimates.

*ii) Small-scale manufacturing*

The gross value added of small-scale manufacturing is estimated by FBS by applying some fixed growth rates on benchmark value. The growth rates used for this purposes are given in Table 4.7. The past series of gross value added at new base has thus been estimated on the basis of new benchmark value and given growth rates, i.e.:

**Table 4.7 Growth Rates of Small Scale Manufacturing**

| Period | % Growth rate |
|---|---|
| 1972-73 *to* 1987-88 | 8.4 |
| 1988-89 *to* 1997-98 | 5.31 |
| 1998-99 | 6.86 |
| 1999-00 *to* 2003-04 | 7.51 |

Sources: FBS (1995, 1998, and 2004)

$$SSM_t = \prod_{i=t}^{-1} (1 + h_{t-i})^{-1} \cdot SSM_0 \qquad (4.13)$$

$SSM_0$ = benchmark estimates of value added at new base in year 1999-00

$SSM_t$ = value added at new base in year $t$ (earlier than 1999-00)

$h_t$ = growth rate of small-scale manufacturing as given in Table 4.7

$t$ ranges from to -27 to -1 such that -27 is year 1970-71 and -1 is year 1998-99.

The wholesale price index of manufacturing has been used for converting the series into current prices.

*iii) Slaughtering*

As mentioned above, slaughtering was earlier part of livestock sector; now it has been classified as manufacturing in line with recommendation of SNA 1993. The products included in slaughtering are the following:

i. meat
ii. animal fats
iii. hides & skins
iv. guts / casings
v. bones & blood
vi. edible offal
vii. head & trotters
viii. horns & hooves

The quantities of these products have been taken from Agricultural Statistics of Pakistan; the base year prices have been taken form Rebasing Book. The inputs of slaughtering are net sales of animals as estimated in livestock section, poultry inputs and other inputs like fees. For poultry inputs we have used the benchmark ratio of

input-to-poultry output, and for other inputs we have used the benchmark ratio of input-to-total output. Thus the value added at constant prices of 1999-00 will be as below.

$$V_t = (1-\sigma)\sum_j P_{j0}Q_{jt} - NS_t - \rho \cdot Y_{pt} \qquad (4.14)$$

$V_t$ = Value added of slaughtering at constant prices of 1999-00

$P_{j0}$ = base year price of product *j* of slaughtering

$Q_{jt}$ = quantity of product *j* of slaughtering in year *t*

$NS_t$ = Net sales in year t at prices of 1999-00

$Y_{pt}$ = Value of poultry output in year t at prices of 1999-00

$\rho$ = Benchmark ratio of poultry input-to-poultry output

$\sigma$ = Benchmark ratio of other input-to-total output

The gross value added computed as above is at constant prices of 1999-00, it has been converted to the same at current prices by using the wholesale price index of meat.

### 4.2.3 Construction

Construction value added is estimated by FBS by applying some coefficients on construction-related investment expenditures (gross fixed capital formation) in different sectors;[45] in the new methodology such coefficients are different than those in old methodology (see Table 4.8). On the basis of available information, we have estimated the past data at new base in the following three steps:

1. worked out construction-related investment expenditure ($\widetilde{E}_{jt}$) by reverse-engineering from old series of construction value added ($\widetilde{V}_{jt}$) and old coefficients ($\widetilde{\mu}_j$)
2. used splicing to convert construction-related investment in each sector at new base

[45] Investment expenditures can be divided into two groups: construction-related like erecting a building, and non-construction like installing machinery. The construction related expenditure, on the other hand, consists of payments to factors of production and purchase of intermediate goods like cement, iron rod, etc. The construction value added excludes intermediate goods from total construction-related investment expenditure. The coefficients given in the Table 4.8, which are based on different studies and experts opinion, represent the value added part of the total construction-related investment.

3. applied new coefficients ($\mu_j$) on new series of construction-related investment expenditure ($E_{jt}$) to estimate value added of construction at new base ($V_{jt}$)

Expressing formally, the construction value added at the new base has been worked out as;

$$V_t = \sum_j V_{jt} = \sum_j \mu_j \cdot \left( \frac{E_j}{\widetilde{E}_j} \right)_{1999-00} \cdot \widetilde{E}_{jt} \qquad (4.15)$$

$$\widetilde{E}_{jt} = \widetilde{V}_{jt} / \widetilde{\mu}_j$$

**Table 4.8 Construction Coefficients**

| Items | Old coefficients | New coefficients |
|---|---|---|
| Land improvement | 0.45 | 0.44 |
| Buildings | | |
| - Residential | 0.42 | 0.31 |
| - Non-residential | 0.42 | 0.39 |
| Canals | 0.33 | 0.44 |
| Drainage | 0.25 | 0.45 |
| Gas pipeline | 0.25 | 0.44 |
| Power lines | 0.25 | 0.11 |
| Roads, streets, highways | 0.45 | 0.31 |
| Railway tracks, runways | 0.25 | 0.12 |
| Telecom lines | 0.25 | 0.33 |
| Tube well | - | 0.37 |
| Other construction | 0.33 | 0.37 |

The value added of construction at constant prices of 1999-00 as estimated above has been converted into that at current prices by using workers' wage index following FBS technique. The series of wage index has been derived from old series of value added of construction at current prices and constant prices; its base has been changed to 1999-00. This index is at annual basis; we have used seasonal variations in quarterly wholesale price index of building materials to derive quarterly wage index.[46]

### 4.2.4 Electricity, gas and water supply

In old methodology, value added of this sector consisted of electricity and gas distribution while the new methodology not only expands the coverage of electricity and gas distribution but also includes water supply in this sector.

[46] Quarterly index is needed to convert quarterly estimates at current prices as will be discussed in next unit.

In case of electricity, Water & Power Development Authority (WAPDA) and the Karachi Electric Supply Corporation (KESC) are the biggest sources of energy generation and distribution. The Independent Power Plants (IPPs) also sell their product to WAPDA and KESC. Moreover the small hydel dams/micro hydel projects, situated in NWFP, are also covered in this sector. The activities in the gas sub-sector are the transmission and distribution of the natural gas.[47]

The FBS estimates gross value added of this sub-sector by product approach. The gross output/gross sale of energy plus other income have been taken as gross output on basic prices which means transport & trade margins and indirect taxes have been eliminated from the gross output. Intermediate consumption (purchaser prices) has been deducted from gross output to arrive at gross value added at basic prices. We have taken the benchmark value added of electricity and gas distribution at 1999-00 prices as estimated by FBS and worked out the past series using growth rates of respective series at old base.[48]

The water supply includes the canal water, tube-wells, domestic supply and commercial and industrial supply; the growth rates of the following variables have been used to estimate the gross value added of the four heads of water supply for past years.

- canal water availability at farm gate
- number of tube-wells
- number of houses
- number of commercial and industrial establishments

The growth rates of the above variables have been applied backward on benchmark estimates of canal water, tube-well, domestic and commercial water supply respectively.

[47] CNG is also included in this sub-sector by FBS while LPG is covered in large-scale manufacturing.

[48] A better alternative could be to estimate gross value added by using sales of electricity and gas, new base prices and intermediate costs; however, this could not be done because past data of intermediate costs were not available. However, as the changes in relative prices within the electricity sub-sector and within gas sub-sector are unlikely the use of splicing can give us good quality estimates.

The gross value added as estimated above is at 1999-00 prices which has been converted to current prices by using wholesale price index of fuel & lighting for electricity and gas and general wholesale price index for water supply.

### 4.3 Services

The services sector consists of six sub-sectors including (i) trade, hotels & restaurants, (ii) transport, storage & communication, (iii) finance and insurance, (iv) ownership of dwelling (v) public administration and defence services, and (vi) social, community and personal services. The gross value added of almost all services is estimated by FBS through income approach. For some services growth rates of certain indicators or some fixed growth rates are applied on benchmark estimates to get gross value added in years other than the base year.[49] Where possible, we have estimated gross value added by income approach. However, in cases where necessary information is not available, we have applied growth rates of closely related variables on benchmark estimates. Detail of our methodology for each of the sub-sectors is given below.

#### 4.3.1 Trade, hotels & restaurants

This sector consists of value added in three types of services, viz., wholesale and retail trade of domestically produced goods, trade of imported goods, and hotel and restaurants services. In the old methodology, hotels and restaurants were not covered under this sector.[50] The value added is estimated by applying trade margins on domestic production and imports. These margins have been changed significantly in the new estimates of value added (Table 4.9). Thus, in order to make the past series consistent with the new estimates, new trade margins on domestic production and imports have been incorporated while estimating the past series of value added of this sector at new base. For the period prior to 1980-81, the benchmark margins of 1980-81 have been used; for the period beyond 1999-00, the new benchmark margins of 1999-00 have been used; while for the period in-between 1980-81 and 1999-00, trade margins have been interpolated by using the two benchmark ratios.

[49] For example growth in number of houses is used for ownership of dwelling; fixed growth rates are used for services like real estate, non-profit institutions serving households (NPISH), etc.

[50] Hotels were, however, covered in community, social and personal services sector in the old methodology.

The value added of hotels and restaurants has been estimated by using information about hotel industry in different hotel surveys undertaken by Tourism Division of Government of Pakistan. The formal description of the technique applied to make new estimates of gross value added of wholesale and retail trade for past years is given below.

$$V_t = \sum_j \alpha_{jt} \cdot \beta_{jt} \cdot Y_{jt} + (U_t)^{-1} \sum_k \pi_{kt} \cdot \theta_{kt} \cdot M_{kt} + VH_t \qquad (4.16)$$

$$\hat{V}_t = \omega_t \sum_j \alpha_{jt} \cdot \beta_{jt} \cdot Y_{jt} + \sum_k \pi_{kt} \cdot \theta_{kt} \cdot M_{kt} + \hat{V}H_t \qquad (4.17)$$

$V_t$ = value added of trade at constant prices of 1999-00

$\hat{V}_t$ = value added of trade at current prices

$Y_{jt}$ = output value at 1999-00 prices of different items of domestic production [51]

$\alpha_{jt}$ = marketable surplus as percent of output value of domestic products

$\beta_{jt}$ = trade margins as percent of output value of domestic products

$\pi_k$ = marketable surplus as percent of import of category $k$ [52]

$\theta_k$ = trade margins as percent of import of category $k$

$M_{kt}$ = import of category $k$ in year $t$

$U_t$ = unit value index of imports with 1999-00 as base year

$VH_t$ = Gross value added of hotel and restaurants at constant prices

$\hat{V}H_t$ = Gross value added of hotel and restaurants at current prices

$\omega_t$ = wholesale price index with 1999-00 as base year

The data needed for above calculation consist of (a) domestic production at new methodology which we already have as outcome of this dissertation, (b) imports and unit value index of imports which is available in FBS publications, and (c) trade margins, tradable surplus ratios and wholesale price index which are also available in FBS publications (d) gross value added of hotel and restaurants which have been estimated as described below.

[51] like rice, wheat, cotton, pulses, meat, etc., (or value added in case of manufacturing)

[52] The imports are classifies into three categories viz., imports of consumer goods, capital goods and raw material.

| Table 4.9 Trade Margins for Domestic Production & Imports | | | | |
|---|---|---|---|---|
| **Items/Commodities** | **Bench Mark 1980-81** | | **Bench Mark 1999-00** | |
| | **Marketable Portion** | **Trade Margin** | **Marketable Portion** | **Trade Margin** |
| ***Major Crops*** | | | | |
| Rice | 80 | 14 | 88 | 18.5 |
| Wheat | 60 | 14 | 76 | 15.5 |
| Sugarcane | 10 | 18 | 33 | 20.5 |
| Cotton | 100 | 18 | 98 | 19.5 |
| Barley, Jowar, Bajra, | 45 | 14 | 80 | 22 |
| Maize | 50 | 14 | 85 | 16.5 |
| Gram | 40 | 14 | 72 | 18 |
| Rapeseed & mustard, canola | 70 | 18 | 93 | 16.5 |
| Sesamum | 70 | 18 | 85 | 22 |
| Tobacco | 60 | 22 | 40 | 19.5 |
| Dry Fodder | 30 | 18 | 70 | 14.5 |
| ***Minor Crops*** | | | | |
| Pulses | 45 | 14 | 65 | 18 |
| Fruits | 90 | 31 | 96 | 38.5 |
| Vegetables | 90 | 35 | 93 | 30 |
| Green Fodder | 10 | 18 | 48 | 16 |
| Other minor crops | 90 | 18 | 94 | 21.5 |
| ***Livestock*** | | | | |
| Milk | 60 | 19 | 78 | 24 |
| Poultry & Eggs | 90 | 32 | 94 | 17.5 |
| Other Products | 90 | 32 | 98 | 25.5 |
| ***Fishing*** | 100 | 33 | 99 | 37.5 |
| ***Forestry*** | 100 | 44 | 94 | 30 |
| ***Manufacturing*** | | | | |
| Large Scale | 100 | 46 | 97 | 42 |
| Small Scale | 80 | 51 | 89 | 48.5 |
| Slaughtering | 90 | 32 | 97 | 26.5 |
| ***Imports*** | | | | |
| Consumer goods | 100 | 16 | 95 | 24.5 |
| Capital goods | 55 | 16 | 68 | 19.5 |
| Intermediate goods | 55-75 | 16 | 72 | 22.5 |
| Source: Rebasing Book (FBS, 2004) | | | | |

There have been three surveys on hotel industry in different years. The Tourism Division, Government of Pakistan undertook two surveys, one in 1979 and the other in 1984 on this industry. A third survey was undertaken in 2000 by Ministry of Minorities, Culture, Sports, Tourism and Youth Affairs. These surveys reported province wise information of hotel industry on, total receipts, operating surplus, establishment cost, etc. We have used this information to work out gross value added by income approach during these years. The average growth rate of value added, adjusted for inflation, between these years has been used to estimate the series of value addition by applying this growth on benchmark estimates of 1999-00.

### 4.3.2 Transport, storage & communication

Transport, Storage & Communications sector consists of the following services:

1. Pakistan Railways
2. Water Transport
3. Air Transport
4. Pipeline Transport
5. Road Transport
6. Communications
7. Storage

The gross value added of these services is estimated through income approach which combines compensation to employees, depreciation and gross operating surplus together. In the new estimates, coverage has been extended to courier services, mobile phones, tour operators, travel agents, pipeline transport, etc. We have used a number of indicators to estimate the gross value added of this sub-sector in years prior to 1999-00. The new methodology covers four modes of transportation viz., railway, air, pipeline, water and road transport.

We have estimated GVA of railway by combining surplus/deficit, staff expenses and depreciation as reported in various issues of Statistical Year Book. This approach gives us GVA at current prices which is deflated by consumer price index to get constant GVA at 1999-00 prices.

The gross value added of air transport for past years is estimated by backward application of growth in passengers (both domestic as well as international) embarked and disembarked at Pakistani airports[53] on the new benchmark estimates of 1999-00 (Rs 29,557 million).[54] The required data were obtained from various issues of annual reports of Civil Aviation Authority.

[53] Passengers in transit were also included.

[54] The air transport also includes cargo transport; however, assuming a constant ratio of average cargo per passenger and a constant output-to-input ratio, we have used growth in air passenger as proxy for growth in gross value added of air transport.

The third mode of transport included in the new methodology of FBS is pipeline transport. Pipeline transport activities of institutions like PARCO, Asia Petroleum Limited, etc., are included in this sub-sector. We have estimated its gross value added by backward projecting the benchmark estimates in 1999-00 (Rs 6,230) on the basis of annual growth rate of oil consumption (quantity in tonnes).[55] The data on oil consumption were obtained from various issues of Pakistan Economic Survey.

Water transport is another important service covered in this sector. It includes services of number of institutions like Pakistan National Shipping Corporation, Karachi Port Trust, Port Qasim, different types of boats, Eng. Vopak Terminal, shipping, forwarding & clearing agents, etc. We have estimated past series of gross value added separately for PNSC, KPT, Port Qasim by back-application of growth rates of gross earnings of PNSC (deflated by CPI), cargo handled at KPT, cargo handled at Port Qasim respectively on their respective benchmark estimates.[56] The Pakistan Economic Survey and Statistical Year Books are sources of data required for these estimates. For boats we have applied the growth rates of old series on new benchmark estimates.

The gross value added of rest of the items in this mode of transport has been estimated on pro-rata basis: Let the sum of the value added of PNSC, KPT, Port Qasim, Boats is $V1_t$ in period $t$; the value added of other institutions is $V2_t$; and $\theta = \left(\frac{V2}{V1}\right)_{1999-00}$ in the base year (1999-00). Then $V2_t = \theta \times V1_t$ for all $t$.

The road transport is the highest contributor in the gross value added of this sector. We have used growth in the number of vehicles on road to project the past series. The gross value added of different types of vehicles were estimated separately. The vehicles covered in this exercise are buses, trucks, wagons, pickups, delivery vans, taxis, rickshaws, NLC and non-mechanized transport. The data of vehicles on road were obtained from various issues of Pakistan Economic Survey.

[55] The underlying assumptions are constant input to output ratio in this service and equality of growth rates of oil transported and consumed.

[56] The growth rates of gross earnings are equal to growth rates of gross value added when we take a constant output to input ratio.

The communication sub-sector includes gross value added of PTCL, mobile phones, Pakistan Post Office, courier services, etc. Given the benchmark estimates of the contribution of PTCL in gross value added during 1999-00 (Rs 51,413 million), we have projected it backward by using the growth in the number of telephone connections. The gross value added of mobile phones for previous years is also estimated on the basis of mobile phone connections. The data on the mobile phone connections were obtained from reports of PTA for period 1995-96 to 1997-98 and from Pakistan Economic Survey 2004-05 for subsequent years. We extended the data set backward up to 1991-92 (the year when the first mobile company, Instaphone started its operation on commercial basis) on pro rata basis. The gross value added of PTCL has been estimated by backward application of growth in telephone connections on benchmark estimates; various issues of Statistical Year Book were the sources for PTCL telephone connections.

The gross value added of Pakistan Post Office for the period 1970-71 to 2004-05 was worked out by using income approach as done by FBS. It was estimated by adding establishment cost, depreciation and operating surplus (deficit). The required data were obtained from various issues of annual reports of Pakistan Post Office. For courier services, we have no information except benchmark estimate of their gross value added in 1999-00 and the fact that pioneer courier company TCS started its operation in May 1983. Using the benchmark estimates of Rs 5,797 million in 1999-00 and taking 1982-83 as first year, we have interpolated the gross value added by using the simple exponential function $V_t = (t)^{\beta}$ where t is equal to 1 for the year 1982-83 and 18 for 1999-00. By solving the function, we get the value of $\beta$ as 2.9979. The properties of this function are such that it suitably explains the expansion of courier services in Pakistan; the absolute value grows exponentially with time and as the volume increases, the growth rate declines with time.

As assumed by FBS, the gross value added of storage is 2% of that of trade; we have adopted the same assumption in our estimates.

Combining value added of all the three categories described above, we get an estimate of trade, storage and communication at constant prices of 1999-00. In order to convert

these estimates into current prices, we have used consumer price index (transport and communication group).

### 4.3.3 Finance & insurance

In the new methodology, coverage of financial institutions has been extended to discount houses, venture capital companies, exchange companies, etc. The gross value added is estimated by product approach whereby intermediate consumption is deducted from gross output. The same estimates can equivalently be obtained by income approach, i.e., by adding wages and salaries, depreciation and gross profit (or deficit). We have used the income approach separately for different groups of financial institutions to work out their contribution in the sector's gross value added during the past years. Detail of various groups of financial institutions is given below.

The State Bank of Pakistan alone contributes 30 percent of total value added of this sector. The benchmark estimate of its value added for the year 1999-00 is Rs 39,201 million. We have worked out gross value added for years prior to 1999-00 by adding establishment cost, depreciation and net surplus available[57] as reported in various issues of Banking Statistics of Pakistan. These estimates are at current prices which have been converted at constant prices of 1999-00 by deflating them by CPI (as per practice of FBS).

The other major contributor to the value added of finance and insurance sector is banking sector which includes domestic and foreign scheduled banks (with share in value added of 39%). The benchmark estimate of value added of all scheduled banks was Rs 52,145 million in 1999-00. Their value added for past years has been estimated by adding up salaries, depreciation and pre-tax profits as given in various issues of Banking Statistics of Pakistan. These estimates have been deflated by CPI to arrive at value added at constant prices of 1999-00.

The same approach has been adopted in case of specialized banks and cooperative banks. Data source for these institutions is also Banking Statistics of Pakistan. The institutions included in this group are Agricultural Development Bank of Pakistan

[57] Adjusted for exchange gain or loss

(now Zarai Tarqiati Bank Ltd.), Industrial Development Bank of Pakistan, Punjab Provincial Cooperative Bank and Federal Bank for Cooperatives.

The other group of financial institutions is DFIs which includes PICIC, Pak-Kuwait Investment Company, Pak-Libya Holding Company, Saudi-Pak Industrial & Agri. Investment Company, NDFC and Bankers Equity Limited, etc., which contributes 6 percent to the gross value added of the sector. Detailed information about DFIs necessary for working out their gross value added is not available, thus we have used growth rate of total assets of these institutions and applied them at benchmark estimates of gross value added in 1999-00. The other institutions covered in finance and insurance sector are HBFC and other housing finance companies, insurance companies, leasing companies, investment bank and modaraba companies, etc. For HBFC, the growth rates in advances and investment during past years have been applied on bench-mark estimate of 1999-00. The required data for DFIs and HBFC are available in Banking Statistics of Pakistan. For leasing companies, investment banks, modarabas and insurance, we have applied growth of respective market-capitalization (deflated by CPI) on benchmark estimates. For rest of the institutions (with share of less than one percent in total value added of finance & insurance sector), we have used growth rate of market-capitalization of finance (overall) as proxy of growth of gross value added. The data sources for these working are various issues of Index Numbers of Stock Exchange Securities (SBP publications).

### 4.3.4 Ownership of dwellings

The estimates of value added in this sector are measured by the rent accruing from ownership of dwellings. This requires cumulative increase of houses and their respective rent. To prepare new estimates of value added, FBS has taken the number of occupied houses in urban and rural areas from the Housing Census, 1998. The estimates of annual average rentals for urban and rural areas have been derived from the rent survey of 1998 conducted by FBS. The intermediate consumption by the type of houses has been estimated through survey undertaken by National Accounts in August 2002. For the subsequent years, the FBS estimates gross value added at constant cost on the basis of extrapolation of base year estimation by the growth of incremental houses. In this dissertation, the value added of this sector has been

estimated by applying growth in imputed rent on benchmark estimates for 1999-00; thus this technique not only incorporates the growth of incremental houses but also changes in their rent which capture the quality differences in housing units. The exercise has been done at provincial level due to the reasons that there are wide variations in average rent in provinces, and also one of the objectives of this dissertation is also to work out provincial value added. The value added for the country is thus the sum of those of provinces as expressed below.

$$DW_t = \sum_p \frac{DW_{p,t+1}}{(1+h_p)} \qquad (4.18)$$

$DW_{p,t}$ = estimates of value added in province $p$ during year $t$

$DW_t$ = total value added in Pakistan at new base in year $t$

$h_p$ = inter-census growth rate of number of imputed rent in province $p$

The benchmark estimate of value added for each province has been estimated by distributing overall benchmark estimates of FBS into provinces according to their share in imputed rent (for detail see section 6.3.4). The estimates as obtained above have been converted into current prices by applying house-rent index.

The data needed for this exercise has been taken from two housing censuses of 1980 and 1998, Housing, Economic and Demographic Survey 1973' and Survey of Rent in District Headquarters of Pakistan 1986, all published by FBS.

### 4.3.5 Public administration and defence

In the old methodology, gross value added of this sector included wages and salaries of government employees, rent on government owned and occupied buildings (assumed fixed at 10% of wage bill) and depreciation at the rate of 5% of the wage bill. On the other hand, gross value added in the new estimates includes wages and salaries, uniform and liveries, bonus and cash awards for meritorious services, and depreciation at the rate of 5% of public fixed investment. In order to adjust the past data according to these changes, we apply splicing on the old series of wages and salaries (a component of value added of old series). The total value added for this sector has been worked out by adding depreciation, which is 5% of public fixed

investment, into the spliced series of wages and salaries. Thus the gross value added in this sector is the following.

$$V_t = \widetilde{W}_t \cdot \left(\frac{W}{\widetilde{W}}\right)_{99-00} + 0.05 \times \widetilde{I}_t \cdot \left(\frac{I}{\widetilde{I}}\right)_{99-00} \quad (4.19)$$

$V_t$ = value added at constant prices as per new methodology

$\widetilde{W}$ = wages and salaries in old series at constant prices

$\left(\frac{W}{\widetilde{W}}\right)_{99-00}$ = ratio of wage and salaries measured by two methodologies in 1999-00

$\widetilde{I}$ = public fixed investment (in general government sector) as per old methodology

$\left(\frac{I}{\widetilde{I}}\right)_{99-00}$ = ratio of public fixed investment measured by two methodologies in 1999-00

The above estimates are at constant prices which have been converted to those at current prices by inflating them with CPI.

### 4.3.6 Social, community and private services

Income arising in the social, community and personal services consists of persons engaged in private education, medical & health services, computer related activities, recreational activities and other household and community services. The old methodology did not include computer related services, real estate services and services of non-profit institutions serving households (NPISH). However, it included hotel services which are not part of the new estimates under this sector. Keeping in view these changes we have estimated the gross value added of this sector for past years as follows.

$$V_t = \widetilde{U}_t \cdot \left(\frac{U}{\widetilde{U}}\right)_{99-00} + C_t + E_t + N_t \quad (4.20)$$

$V_t$ = value added of SCP services at constant prices as per new estimates

$\widetilde{U}$ = value added of SCP services excluding hotel at constant prices as per old methodology

$U$ = value added of SCP services excluding hotel, computer related services, real estate, NPISH, etc. as per new estimates

$\left(\frac{U}{\widetilde{U}}\right)_{99-00}$ = ratio of the two values measured in 1999-00

$C_t$ = value added of computer related services at 1999-00 prices

$E_t$ = value added of real estate services at 1999-00 prices

$N_t$ = value added of NPISH at 1999-00 prices.

The value added of computer related services has been estimated by applying back the growth rate of imports of computer related equipment (deflated by unit value index) on benchmark estimates of 1999-00.[58] Data of imports of computer related equipment were obtained from UNCTAD CD-ROM of trade data (2004); SITC code is 752. For value added of the other two components viz., real estate and NPISH, we have applied the fixed growth rates of 3.53 percent and 6.81 percent respectively as used by the FBS.

[58] The FBS has recently conducted a census of software industry and related services and estimated benchmark gross value added for year 1999-00. However, such a survey or similar information are not available for past years. So we have used the growth in import of computer related equipment as a proxy for growth in computer related services.

**Box 4.1 Adjustment Technique**

Let $N_{at}$ and $N_{bt}$ are two different values of a variable in a given year $t$; both have been measured by two different methodologies and valued at two different base year prices such that:

$N_{at} = P_a \,.\, Q_{at}$ (B4.1)

$N_{bt} = P_b \,.\, Q_{bt}$

The values of $N_{bt}$ are known for all $t$ but the value $N_{at}$ is known only for base year $a$. We wish to estimate $N_{at}$ for other years. For the year $a$, a link can be established between the two series, i.e.,

$$\frac{N_{aa}}{N_{ba}} = \frac{P_a \cdot Q_{aa}}{P_b \cdot Q_{ba}} = A \cdot B \qquad \text{(B4.2)}$$

where $A = P_a / P_b$ ; $B = Q_{aa} / Q_{ba}$

In principal, $Q_{at}$ and $Q_{bt}$ measure the same quantity in the same unit, so $B = 1$ for all $t$. $A$ is constant for all $t$ and is known. Thus the new series $N_{at}$ can be estimated from the second series ($N_{bt}$) as follows.

$$N_{at} = A \cdot N_{bt} = \left(\frac{P_a}{P_b}\right) \cdot P_b Q_{bt} = P_a \cdot Q_{at} \qquad \text{(B4.3)}$$

However, in the present case of rebasing of national income accounts in Pakistan, $Q_{at}$ and $Q_{bt}$ are not necessarily the same because there are improvements and changes in measurement techniques, so $B \neq 1$. However, we can still estimate the new series ($N_{at}$) if it is assumed that $B$ is constant for all $t$, such that:

$$B = \left(\frac{Q_{aa}}{Q_{ba}}\right) = \left(\frac{Q_{at}}{Q_{bt}}\right) \qquad \forall\, t \qquad \text{(B4.4)}$$

Thus the new series can be estimated as

$$N_{at} = A \cdot B \cdot N_{bt} \qquad \text{(B4.5)}$$

# 5 Quarterisation of Annual National Accounts

National income accounts in Pakistan are compiled by FBS on annual basis; there are no official estimates of higher frequency data (e.g. quarterly) available in Pakistan. There are however, some unofficial estimates of quarterly data like Kemal and Arby (2004) who have recently quarterised GDP along with its sub-sectors for years 1971-72 to 2002-03; earlier Bengaliwala (1995) estimated quarterly series for years 1971-72 to 1989-90. Both the studies give quarterly national accounts at constant prices of 1980-81. The present study offers quarterly national accounts at new base of 1999-00 prices. The study adopts Kemal and Arby (2004) methodology to quarterise the new series of GDP and its sub-sectors at 1999-00 prices as estimated in previous chapter of the dissertation.[59] Their methodology has been extended or modified according to the needs of the new methodology of annual estimates. In the next three sections, we have outlined the methodology adopted for three sectors viz., agriculture, industry and services.

## 5.1 Agriculture

### 5.1.1 Major crops

Quarterly gross value added (GVA) of major crops has been worked out on the basis of the following three kinds of information:

i. Quarterly Harvest Calendar of each crop in each province
ii. Province-wise production of each crop
iii. Annual value added of each crop

The quarterly value added at 1999-00 prices has been calculated as follows with the assumption that input-to-output ratio in a quarter is the same as that in a given year.

$$V_{kt} = \left( \frac{V_t}{Y_t} \right) \cdot Y_{kt} \qquad (5.1)$$

$V_t$ = value added in year $t$ at new base

[59] As described in chapter 2, Kemal and Arby (2004) technique is more detailed and comprehensive compared with Bengaliwala (1995), though, in essence both are the same.

$V_{kt}$ = value added in quarter $k$ and year $t$

$Y_t$ = value of output in year $t$ at new base

$Y_{kt}$ = value of output in quarter $k$ and year $t$, computed as follows

$$Y_{kt} = \sum_j \sum_p \left[ W_{jkp} \left( P_{j0} + b_j . \breve{P}_{j0} \right) Q_{jpt} \right] \qquad (5.2)$$

$W_{jkp}$ is weight of quarter $k$ for production of crop $j$ in province $p$ such that $\sum_k W_{jkp} = 1$,

$P_{j0}$ is base price of crop $j$, $\breve{P}_{j0}$ is base price of by-product of crop $j$, and $Q_{jpt}$ is physical production of crop $j$ in province $p$. The data used for quarterisation are the same as used in rebasing exercise of chapter 4 of this dissertation except for harvest calendar[60]; this calendar is obtained from FBS and reported in Annexure A. The above quarterly estimates are at constant prices of 1999-00. In order to convert them at current prices, we have used quarterly wholesale price index of crops; the computation of the index has already been described in chapter 4, section 4.1.1. The quarterly value added of major crops at current prices ($\hat{V}_{kt}$) can be worked out as follows.

$$\hat{V}_{kt} = P_{kt} \cdot V_{kt} \qquad (5.3)$$

However, there is a snag: the sum of $\hat{V}_{kt}$ as calculated above is not necessarily equal to $\hat{V}_t$ (the annual value added for $t$ as estimated by equation 4.5 in chapter 4). Therefore, in order to maintain additivity (i.e. sum of quarterly value added should be equal to annual value added), we have adjusted quarterly estimates at current prices by adding one fourth of the difference ($\hat{V}_t - \sum_k \hat{V}_{kt}$) to each quarter.

### 5.1.2 Minor crops

Quarterly estimates of value added of minor crops have been worked out by using the above technique of major crops except that harvest calendar used is related to minor crops. The harvest calendar of minor crops has been obtained from the FBS (see Annexure A). The quarterly estimates of gross value added of minor crops at current

[60] Harvest calendars of crops have been prepared by the FBS for each province on the basis of recording the output in the quarter in which it is harvested. There is a conceptual problem with such calendar that it does not take into account activities related with sowing of a typical crop which may have occurred in some other quarters. However, these calendars have practical advantages in using them for quarterisation.

prices have then been worked out by applying wholesale price index of individual crops to constant price estimates of minor crops; the technique is the same as described above for major crops.

### 5.1.3 Livestock

The quarterly distribution of livestock value added has been undertaken by applying Kemal and Arby (2004) methodology whereby gross output of milk has been distributed in the four quarters with ratios 17.5%, 35%, 30% and 17.5% respectively and the rest of the output of livestock is quarterised uniformly as given below.

$$
\begin{aligned}
V_{1t} &= V_{4t} = V_t \cdot \left(0.175 m_t + 0.25(1 - m_t)\right) \\
V_{2t} &= V_t \cdot \left(0.35 m_t + 0.25(1 - m_t)\right) \\
V_{3t} &= V_t \cdot \left(0.30 m_t + 0.25(1 - m_t)\right)
\end{aligned}
\qquad (5.4)
$$

$m_t$ is share of milk in total gross output of livestock, $V_{1t}$, $V_{2t}$, $V_{3t}$, and $V_{4t}$ are value added in quarter one, two, three and four respectively. The quarterly wholesale prices indices of fresh milk, eggs, chickens and meat have been used for converting constant price estimates into quarterly current price estimates (for detail see section 4.1.3).

### 5.1.4 Fishing

Annual value added of fishing has been quarterised on the basis of average seasonal pattern for marine and land fish as worked out in an in-house study on fishing by FBS. The seasonal factors are 0.2012, 0.3069, 0.2365 ad 0.2554 for marine fish in the respective four quarters; and 0.1121, 0.2735, 0.3498 and 0.2646 for land fish in respective four quarters. The quarterly wholesale price index of fish has been applied for estimates at current prices.

### 5.1.5 Forestry

For quarterly distribution of value added, we have used coefficients estimated by Quaidian Economic Consultants (2001) in a study on Forestry for FBS. These coefficients are 0.2009, 0.2561, 0.2882, 0.2548 for quarter one, two, three, and four respectively. The quarterly wholesale price indices of timber and firewood have been used for current prices estimates.

## 5.2 Industry

### 5.2.1 Mining & quarrying

The quarterly output value of mining and quarrying has been computed by applying 1999-00 prices on quarterly production of 24 mining items covering 88% of the total output value of this sector. For rest of the ingredients, the combined seasonal factors of 24 items have been used. The input costs have been deducted from quarterly output value at the rates mentioned in Table 4.6 of chapter 4; with this we get quarterly estimates of value added of mining & quarrying at constant prices of 1999-00. These estimates have then been converted into current prices on the basis of quarterly composite wholesale price index of coal and natural gas (for detail see section 4.2.1). The data on quarterly production of mining items have been taken from monthly statistical bulletin of FBS.

### 5.2.2 Manufacturing

*Large-scale and Small-scale Manufacturing:* Quarterly value added of manufacturing has been calculated by using Kemal and Arby methodology, i.e. by applying the seasonal factors of the quantum index number of large-scale manufacturing. However, in this case the quantum index number is self constructed on the basis of new weights and new base (1999-00). The quarterly value added at current prices has been estimated by using wholesale price index of manufacturing.

*Slaughtering:* Annual value added of slaughtering both at constant and current prices has been distributed into four quarters according to the coefficients derived in the study by FBS on slaughtering industry (FBS, 2002f). These coefficient are; 18%, 25%, 35%, and 22% for quarter one, two, three and four respectively.

### 5.2.3 Construction

We have used seasonal variations in cement production for quarterisation of the gross value added of construction at constant prices. Adopting from Kemal and Arby, we have proceeded as follows.

$$
\begin{aligned}
V_{1t} &= V_t * C_{4t}/C_t \\
V_{2t} &= V_t * C_{1t}/C_t \\
V_{3t} &= V_t * C_{2t}/C_t \\
V_{4t} &= V_t * C_{3t}/C_t
\end{aligned}
\qquad (5.5)
$$

Where $V_{kt}$ is value added of construction in quarter $k$ and year $t$; $V_t$ is annual value added in year $t$; $C_{kt}$ is production of cement in quarter $k$ and year $t$; and $C_t$ is annual production of cement in year $t$. The quarterly estimates at constant prices thus obtained have been converted into current prices by using quarterly wage index. As already mentioned in section 4.2.3, the wage index is available at annual basis; we have generated a quarterly series of this index by applying seasonal factors of quarterly wholesale price index of building material.

### 5.2.4 Electricity, gas and water supply

The gross value added of electricity and gas has been quarterised on the basis of quarterly factors as given in the Study on Electricity & Gas (FBS, 2002h), and the same of water supply has been quarterised on the basis of quarterly seasonal factors of canal, tube-well, domestic and commercial water supply as reported in the Study on Water Supply (FBS 2001). The quarterly gross value added as estimated above is at 1999-00 prices which has been converted to current prices by using quarterly wholesale price index of fuel & lighting for electricity and gas and general wholesale price index for water supply.

## 5.3 Services

### 5.3.1 Trade, hotels & restaurants

The trade margins and ratio for marketable portion as used in annual estimates have been used also for quarterly estimates of value added of this sector. For quarterly estimates at constant prices, the margins have been applied on quarterly imports and domestic production at constant prices. The gross value added of hotels and restaurants has been quarterised on the basis of seasonal pattern of room occupation as reported in Hotel Industry in Pakistan – Survey 2000. The constant price estimates of domestic production related trade and hotels have been converted in to current

prices by applying quarterly wholesale price index (general) and trade related with imports have been converted into current prices on the basis of quarterly unit value index of imports (base 1999-00).

### 5.3.2 Transport, storage & communication

Annual value added of this sector has been quarterised by applying Lisman and Sandee (1964) method which derives a smooth continuous quarterly time series from the annual data using the following disaggregating formula:

$$\begin{bmatrix} x_{1t} \\ x_{2t} \\ x_{3t} \\ x_{4t} \end{bmatrix} = \begin{bmatrix} 0.073 & 0.198 & -0.021 \\ -0.010 & 0.302 & -0.042 \\ -0.042 & 0.302 & -0.010 \\ -0.021 & 0.198 & 0.073 \end{bmatrix} \cdot \begin{bmatrix} X_{t-1} \\ X_t \\ X_{t+1} \end{bmatrix} \qquad (5.6)$$

Where $X_t$ is annual figure in year $t$, and $x_{jt}$ is quarterly figure in quarter $j$ of year $t$.

The quarterly consumer price index of transport and communication group has been used to convert constant price estimates of this sector into current price estimates.

### 5.3.3 Finance & insurance

Following Kemal and Arby technique of quarterisation, we have quarterised net profit of financial institutions on the basis of seasonal factors of M2; establishment cost and depreciation is distributed into four quarters equally.[61] The quarterly consumer price index has been used to convert constant price estimates into current price estimates.

### 5.3.4 Ownership of dwellings

Lisman and Sandee (1964) technique has been used for quarterisation of annual series at constant prices as done by Kemal and Arby (2004). The quarterly house rent index has been used to convert constant price estimates into current price estimates.

[61] The combined seasonal factors of SBP, scheduled banks and specialized banks have been used for other financial institutions.

### 5.3.5 Public administration & defence

This sector consists of two components, viz., wages and salaries of government employees, and depreciation. While we have uniformly distributed depreciation into four quarters, wages has been distributed by factors 0.244, 0.244, 0.256, and 0.256 for respective quarters as derived by Kemal and Arby. The current price estimates have been obtained by using quarterly consumer price index.

### 5.3.6 Community, social & personal services

Lisman and Sandee (1964) technique has been used for estimating quarterly value added of this sector at constant prices. For current price estimates, we have used a composite deflator based on consumer prices indices of Cleaning, Laundry & Personal Appearance group and Recreation, Entertainment & Education group.[62]

[62] The two groups of consumer price index have weights of 5.4 and 3.12 in overall CPI; we have used these weights to form a composite index for this sector.

# 6 Provincialisation of National Accounts

This chapter attempts to disaggregate Pakistan's GDP into provinces' GDP on the basis of available information at provincial level. The basic plan of disaggregation is to estimate the extent of economic activity taking place within the boundaries of a province. The provincial gross value added in certain sub-sector have been estimated in the same manner as for Pakistan level estimates, i.e. direct estimation by product approach; for example major and minor crops, livestock, fishing, mining, etc.[63] While gross value added in other sub-sectors has been estimated by disaggregating the Pakistan's GDP national on the basis of some allocators. Detail of technique used for each sector has been given in the following three sections.

## 6.1 Agriculture

### 6.1.1 Major crops

As mentioned above, the provincial estimates of output value of major crops at constant prices of 1999-00 have been made by using the same technique as used for annual national estimates of Pakistan. The provincial value of output and value added have been estimated as below:

$$Y_{pt} = \sum_j \left[ \left( P_{jp0} + b_j . \breve{P}_{jp0} \right) Q_{jpt} \right]$$

$$V_{pt} = Y_{pt} - \sum_i g_i \cdot d_{ipt} \cdot N_i \qquad (6.1)$$

Where $g_i$ is the share of major crops in input $i$ as given in Table 4.1, $d_{ipt}$ is provincial share in input $i$, and $N_i$ is the total value of input $i$ of crops. Provincial shares in the inputs have been computed on the basis of distribution of closely related indicators or some fixed ratios. The input value of seeds has been distributed into provinces according to the provincial shares in total crops production; fertilizer and pesticides have been distributed according to the consumption of fertilizer by provinces (as reported by Agricultural Statistics of Pakistan) and other inputs are distributed

[63] National price deflators have been used for all the provinces due to unavailability of provincial price indices. While the use of the same prices may not affect the results significantly in case of commodity producing sectors due to the tendency of price equalization with free mobility of goods across the regions, the provincial value added of services sector may be affected.

according to fixed ratios for provinces as used in Rebasing Book for the year 1999-00 (Table 6.1).

| Table 6.1 Provincial Distribution of Some Inputs (ratio to total) | | | | |
|---|---|---|---|---|
| | **Punjab** | **Sindh** | **NWFP** | **Balochistan** |
| Water | 0.6797 | 0.1873 | 0.0389 | 0.0941 |
| Ploughing & planking | 0.6970 | 0.1813 | 0.0822 | 0.0395 |
| Transport charges | 0.6808 | 0.2315 | 0.0621 | 0.0256 |
| Wastages | 0.6726 | 0.2123 | 0.0650 | 0.0501 |
| Source: Rebasing Book (FBS, 2004) | | | | |

### 6.1.2 Minor crops

Like major crops, the value added of minor crops has also been provincialised on the basis of province wise production data and base year prices, i.e.

$$Y_{pt} = \sum_j P_{jp0} \cdot Q_{jpt}$$

$$V_{pt} = Y_{pt} - \sum_i (1 - g_i) \cdot d_{i\,pt} \cdot N_i \qquad (6.2)$$

$g_i$ is the share of major crops in total input.

### 6.1.3 Livestock

The gross value added of livestock has been provincialised according to the shares of provinces in livestock population. For each of the products of livestock, we have used the population of relevant type of animals; for example, provincial distributions of cows, buffaloes, sheep, goats and camels have been used in case of milk, provincial distribution of work animals have been used for draught power, and so on (see Table 6.2 for detail).

| Table 6.2 Provincial Distribution of Livestock | |
|---|---|
| **Items** | **Basis for Provincial Distribution** |
| Natural Growth | Provincial distribution of livestock population |
| Net Sale | Provincial distribution of Animal sold for slaughtering |
| Milk | Provincial distribution of cows, buffaloes, sheep, goats, camel |
| Draught Power | Provincial distribution of work animal |
| Dung & Urine | Provincial distribution of livestock population |
| Wool and Hair | Provincial distribution of sheep and goats |
| Poultry Products | Provincial distribution of poultry |

### 6.1.4 Fishing

The gross value added of fishing has been provincialised on the basis of provincial output of land and marine fish as reported in Agriculture Statistics of Pakistan (various issues). The formula used for this purpose is the same as for national value added in fishing sector (as described in chapter 4, equation 4.10). The following equation gives the provincial value added, and by construction the sum of the provincial value added becomes equal to the national value added.

$$V_{pt} = \left(2 \times Q_{pt} \times 34.75 \times 0.84\right) + \left(M_{pt} \times 16.43 \times 0.64 \times 0.935\right)^{64} \qquad (6.3)$$

$V_{pt}$ = provincial value added of fishing at constant prices of 1999-00

$Q_{pt}$ = quantity of inland fish caught in province $p$

$M_{pt}$ = quantity of marine fish cost in province $p$

Data of inland and marine fish catching have been obtained from Agricultural Statistics of Pakistan. The base year prices and ratios for input costs have been taken from the Rebasing Book. The value added at current prices has been be estimated by applying wholesale price index of fish on constant price value added.

### 6.1.5 Forestry

The provincialisation of forestry value added has been done on the basis of revenue earned by forest departments of provinces; the required information has been taken from Agricultural Statistics of Pakistan.

## 6.2 Industry

### 6.2.1 Mining & quarrying

As mentioned in section 4.2.1, provincial data of production of 24 mining items are available in Statistical Year Book. Thus exactly the same technique has been used as described in section 4.2.1 for provincial estimates of the value added of mining and quarrying.

[64] 34.75 and 16.43 are base years prices of inland and marine fish respectively in rupees/kg. The quantity of inland fish is doubled in these calculations to adjust underreporting (of 100 percent).

### 6.2.2 Manufacturing

*i) Large-scale & Small-scale Manufacturing:* Share of provinces in value added as reported in Census of Manufacturing Industries (CMI) of various years have been used to provincialise the new estimates of LSM value added. Similarly, in case of provincialisation of gross value added of small-scale manufacturing, the shares of provinces in value added as reported by Census of Small-scale & Household Manufacturing Industries (CSHMI) of various years.[65]

*ii) Slaughtering:* The output value of different products of slaughtering has been provincialised on the basis of provincial population of relevant kind of animals, i.e.

- beef is provincialised on the basis of population of cattle and buffaloes
- mutton on the basis of sheep and goats,
- camel meat on the basis of camels,
- poultry meat on the basis of poultry population,
- skin (sheep & goat) on the basis of sheep & goat,
- hides on the basis of cattle and buffaloes
- all other products on the basis of provincial distribution of total meat.

### 6.2.3 Construction

The indicators used for provincialisation of construction value added have been given in the following table.

**Table 6.3 Provincial Distribution of Construction**

| **Items** | **Indicators (Data Source)**[66] |
|---|---|
| Land improvement | Number of houses in provinces (weighted sum of kacha, semi-pucca and pucca houses; weights are relative rents) |
| Buildings | |
| Drainage | |
| Canals | Development Expenditure on Irrigation by provinces |
| Gas Pipeline | Gas transmission in km in provinces |
| Roads, Streets, Highways | Length of roads |
| Railway tracks, Runways | Length of railway route |
| Telecom lines | Number of telephones |
| All other items | The combined distribution of above items |

[65] Both CMI and CSHMI are available for selected years; for the decade of 1970s we have used average ratios worked out from censuses undertaken in this decade, for 1980s we have used average ratios worked out in the decade of 1980, and so on with the assumption that the industrial structure is less likely to change in a decade period.

[66] There are some gaps in data series which have been filled on pro rata basis.

### 6.2.4 Electricity, gas and water supply

The gross value added of electricity and gas has been provincialised on the basis of provinces shares in consumption of electricity and gas, as reported in various issues of Energy Year Books. The gross value added of water supply has been provincialised on the basis of provincial shares in area irrigated by canal water, number of tube-wells, number of houses and number of commercial and industrial establishments. Province wise irrigation by canal water and number of tube wells have been taken from Agricultural Statistics of Pakistan, number of houses from housing and population censuses, and number of commercial and industrial establishments have been obtained from various issues of Annual Establishment Enquiry.

## 6.3 Services

### 6.3.1 Trade and hotel & restaurants

We have applied the same trade margins and tradable surplus ratios for provinces as used for national estimates. We already have provincial domestic production with us; the imports to the country have been provincialised on the basis of the following indicators:

- Imports of consumers goods: share of provinces in urban population
- Imports of capital goods: provincial share in industry
- Imports of raw Material: provincial share in industry

The trade margins for imports have then be applied on provincial estimates of imports to estimate import related value added of trade.[67]

The value added of hotels and restaurants have been provincialised on the basis of provincial shares in years of 1979, 1984, 2000 for which surveys of hotel and restaurants are available; the shares have been kept constant for inter-survey years.

### 6.3.2 Transport, storage & communication

The provincialisation of this sector is undertaken on the basis of a number of different indicators of which provincial distribution is available. The gross value added of

[67] Here is a caveat, while we have provincialised trade related to national level of imports, trade of commodities coming from other provinces could not be estimated due to unavailability of data series of inter-provincial commodity flows.

Pakistan Railway is provincialised on the basis of length of railway routes in each province. The routes in kilometers are reported in different issues of the provincial development statistics.

The provincial distribution of gross value added of air transport is undertaken on the basis of all passengers handled at airports located in each province. Airport-wise information of passengers has been obtained from annual reports of Civil Aviation Authority. The gross value added of pipeline transport is distributed into provinces on the basis provincial oil consumption. The province-wise oil consumption has been obtained from various issues of Pakistan Energy Year Book.

In case of the gross value added of water transport, we have allocated 100% value added of PNSC, KPT, Port Qasim and others to Sindh. The value added of boats has been allocated to the four provinces on the basis of distribution of number of boats in each province. The province-wise numbers of boats are obtained from various issues of Agricultural Statistics of Pakistan.

The gross value added of road transport is provincialised on the basis of number of vehicles registered in provinces. The number of registered vehicles in each province has been obtained from Statistical Year Books. The provincial distribution of non-mechanized transport is undertaken on the basis of provincial population of camels, horses, asses and mules which are available in Agricultural Statistics of Pakistan.

The gross value added of telecommunication sector is distributed into provinces on the basis of number of telephones in each province. Such numbers are given in different issues of provincial development statistics. The gross value added of postal services is provincialised on the basis number of postal employees in each province; annual reports of Pakistan Post Office are the sources. The provincial distribution of storage is undertaken on the basis of provincial gross value added of trade which has already been estimated in a separate exercise.

### 6.3.3 Finance & insurance

The gross value added of finance and insurance has been provincialised on the basis of provincial distribution of employees working in financial institutions. The information about this distribution is obtained from various issues of Annual Establishment Enquiry published by FBS. The latest such enquiry is available for the year 1989-90; for later years, we have used the same year's distribution.

### 6.3.4 Ownership of dwellings

Provincial distribution of imputed rent on dwellings has been used for provincialisation of value added of this sector. The imputed rent has been computed by multiplying the number of houses with average rent for different categories of houses viz. pucca, semi-pucca and kutcha which have been obtained for each province from different housing and rent surveys as mentioned in section 4.3.4. Formally, the computation of imputed rent in a province is expressed as:

$$R_p = \sum_k (r_{kp} \times H_{kp}) \tag{6.4}$$

where $R_p$ is total imputed rent in province $p$, $r_{kp}$ is average rent of category $k$ of a house in province $p$ and $H_{kp}$ is number of houses in $k$ category in province $p$. The share of a province in imputed rent is then used to provincialise the benchmark estimate of gross value added of ownership of dwelling in 1999-00. i.e.,

$$DW_{p,bm} = \left( \frac{R_p}{\sum R_p} \right) \times DW_{bm} \tag{6.5}$$

where $DW_{bm}$ is benchmark value addition of ownership of dwelling in 1999-00 as estimated by FBS. The gross value added of years other than 1999-00 has been estimated by applying annual compound growth rates in imputed rent on benchmark estimates of 1999-00 at provincial level.

### 6.3.5 Public administration and defence

We have made two parts of value added of this sector; value added of federal government and value added of provincial government. The value added of federal government has been provincialised by the distribution of federal employees on

provincial basis. These information are available in periodic census reports of Public Administration Research Centre, Cabinet Secretariat, Government of Pakistan. The other part has been distributed into provinces on the basis of provincial expenditure on general government obtained from various issues of Statistical Year Book.

### 6.3.6 Social, community and private services

The gross value added of sector has been provincialised on the basis of provincial distribution of employees working in such services as reported by various issues of Annual Establishment Enquiry published by FBS.

# 7 Analysis of Results

The techniques of re-basing the national accounts and their decomposition in quarters and provinces as described in previous chapters have been applied on data from 1970-71 to 2004-05. This chapter gives an analysis of results and compares our results with official estimates at old base for the period 1970-71 to 1998-99 and at new base for the period 1999-00 onward. Also a comparison of quarterisation and provincialisation of national accounts as undertaken in this study has been made with those of Bengaliwala (1995) and Bengali and Sadaqat (2005).

## 7.1 Gross Domestic Product

The estimates of national accounts by this study are generally very close to those of FBS for the period 1999-00 onward except in case of some sub-sectors (details of which have been given in relevant sections). A comparative statement of estimates of overall gross value added is given in the Table 7.1.1 which shows that FBS estimates of GDP are slightly overestimated as compared to this study though the difference between the two series is just around -1 percent.

**Table 7.1.1 GDP: Comparison of Estimates**
Rs million (1999-00 prices)

| | Present study's estimates | FBS estimates | % Difference |
|---|---|---|---|
| 1999-00 | 3,516,973 | 3,562,020 | -1.3 |
| 2000-01 | 3,600,378 | 3,632,091 | -0.9 |
| 2001-02 | 3,720,350 | 3,745,118 | -0.7 |
| 2002-03 | 3,893,462 | 3,922,307 | -0.7 |
| 2003-04 | 4,179,058 | 4,215,582 | -0.9 |
| 2004-05 | 4,553,747 | 4,577,061 | -0.5 |

Compared with the growth rates of the old series (1980-81 base), the new growth rates follow the same pattern over time (Fig 7.1.1); however, the actual rates are different which may be due to changes in relative prices and quantity weights in different sectors. It is also observed that the decade of 1980s remains the high growth era while the decade of 1990s comes out as low growth period according to new base estimates (Table 7.1.2).

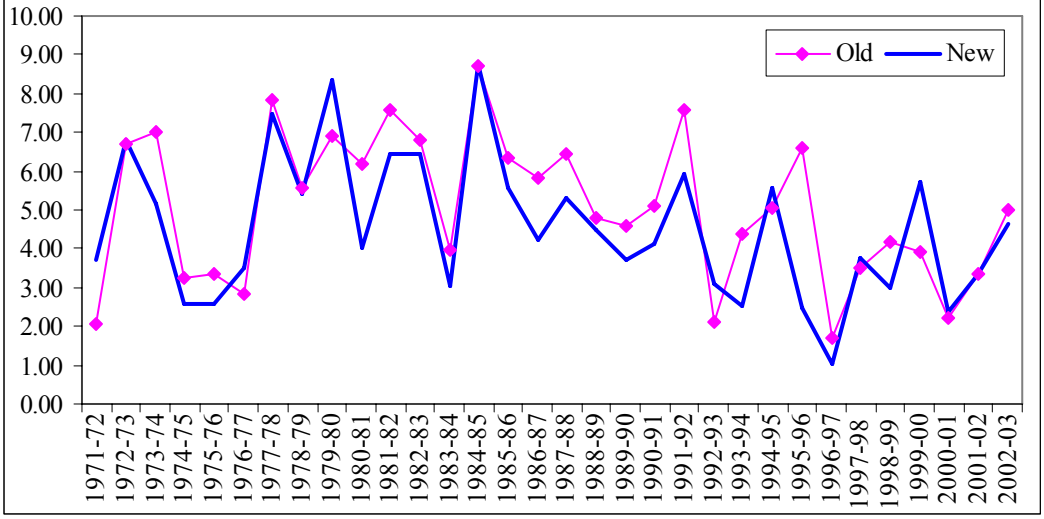
**Table 7.1.2 GDP: Old and New Growth Rates**
(averages)

| | Old Base (1980-81) | New Base (1999-00) |
|---|---|---|
| 1970-75 | 4.8 | 4.6 |
| 1975-80 | 5.3 | 5.5 |
| 1980-85 | 6.6 | 5.8 |
| 1985-90 | 5.6 | 4.7 |
| 1990-95 | 4.8 | 4.2 |
| 1995-00 | 4.0 | 3.2 |
| 2000-05* | 3.5 | 5.3 |
| Overall | 5.0 | 4.7 |

* Growth of old base data is for 2000-03

While the new growth rates are almost equal to old growth rates for the decade of 1970s, these are lower for the decade of 1980s and 1990s.

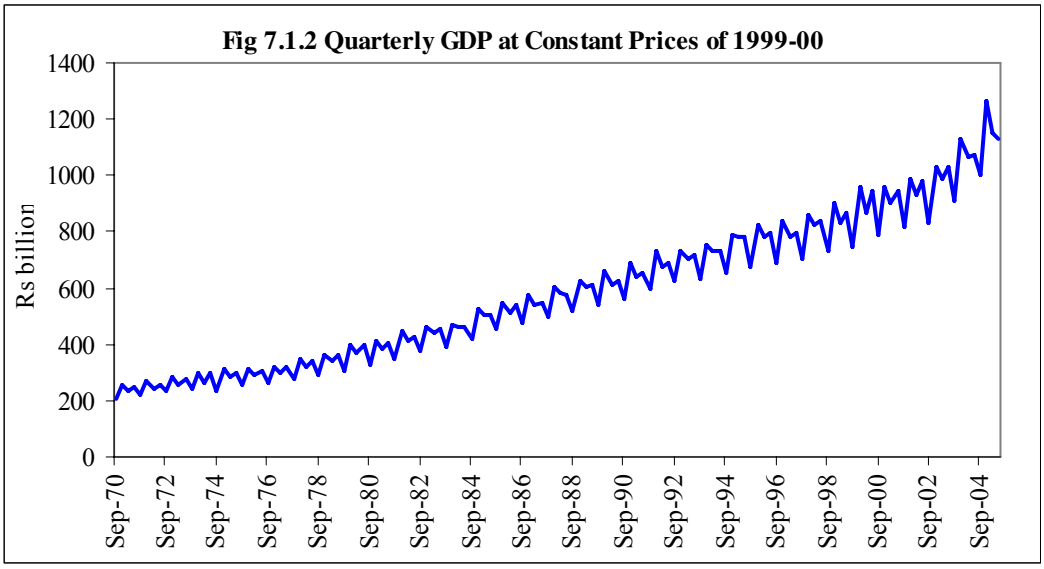
**Fig 7.1.1 GDP - Growth Rates**

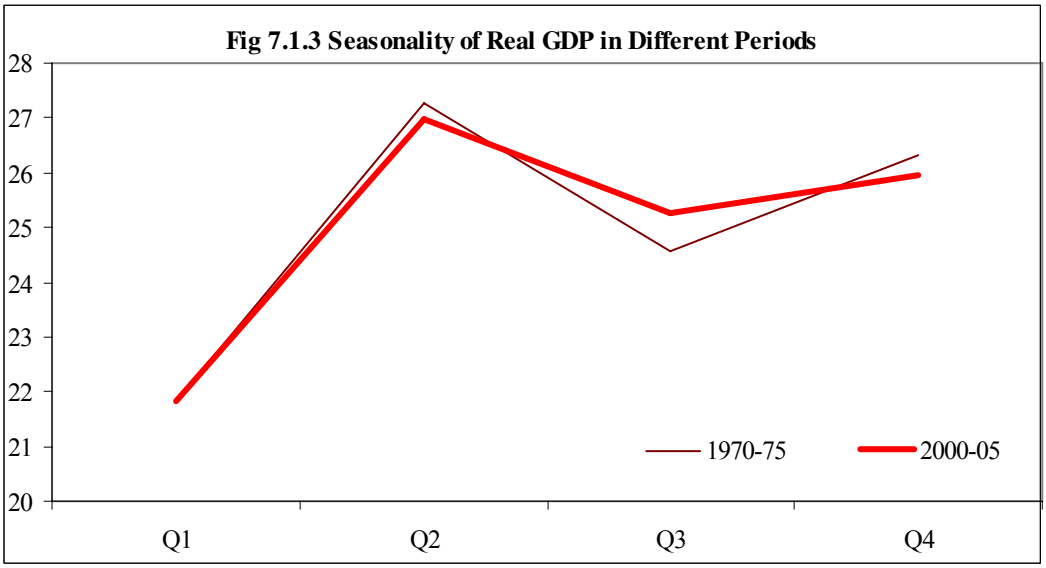



The results of quarterisation of national accounts show that on average 21.8 percent of the annual GDP is produced in the first quarter (Jul-Sep) followed by the third quarter (Jan-Mar) with 25.2 percent of annual GDP (Table 7.1.3). In the second quarter (Oct-Dec) the production of goods and services is the highest at 26.9 percent. In the last quarter (Apr-Jun) production is also high with 26.1 percent of the annual. Fig 7.1.2 shows a time series of quarterly GDP since September 1970, it is evident that the seasonal pattern has changed slightly over the years (see also Fig 7.1.3). This result is consistent with Kemal and Arby (2004) which showed that seasonality in GDP had declined over time.

**Table 7.1.3 GDP: Quarterly Seasonal Factors**
(1999-00 prices)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
|---|---|---|---|---|
| 1970-75 | 21.8 | 27.3 | 24.6 | 26.3 |
| 1975-80 | 21.5 | 26.8 | 25.1 | 26.6 |
| 1980-85 | 21.5 | 26.8 | 25.5 | 26.1 |
| 1985-90 | 22.1 | 26.8 | 25.4 | 25.7 |
| 1990-95 | 22.1 | 26.7 | 25.5 | 25.8 |
| 1995-00 | 21.8 | 27.0 | 25.2 | 26.0 |
| 2000-05 | 21.8 | 27.0 | 25.3 | 25.9 |
| Overall | 21.8 | 26.9 | 25.2 | 26.1 |




The seasonal pattern as estimated by the present study are different to the one estimated by Bengaliwala (1995). According to Bengaliwala, the highest production of goods and services takes place in the fourth quarter with a seasonal factor of 28.1 percent and the second quarter is second in the ranking (Table 7.1.4). However, the first quarter remains a quarter of lowest economic activities in Bengaliwala as in the present study.

| **Table 7.1.4 Seasonal Factors of GDP and its Sub-sectors - Bengaliwala results for years 1972 to 1990** (1980-81 prices) | | | | |
|---|---|---|---|---|
| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
| GDP | 21.8 | 27.5 | 22.7 | 28.1 |
| Agriculture | 17.1 | 32.3 | 13.5 | 37.1 |
| Major crops | 9.7 | 40.4 | 7.1 | 42.8 |
| Minor crops | 33.4 | 18.4 | 16.2 | 31.9 |
| Livestock | 24.2 | 22.5 | 24.5 | 28.7 |
| Fishing | 21.2 | 36.8 | 21.1 | 20.9 |
| Forests | 30.3 | 20.1 | 19.9 | 29.7 |
| Mining & Quarrying | 25.7 | 25.2 | 24.8 | 24.3 |
| Manufacturing | 22.1 | 26.1 | 27.7 | 24.2 |
| Construction | 22.2 | 24.9 | 26.2 | 26.7 |
| Electricity & gas distribution | 25.5 | 24.7 | 24.2 | 25.6 |
| Transport, storage & communication | 23.0 | 23.3 | 25.8 | 27.9 |
| Wholesale & retail trade | 25.0 | 26.1 | 24.2 | 24.7 |
| Banking & insurance | 24.6 | 25.4 | 25.1 | 24.9 |
| Ownership of dwellings | 25.6 | 25.2 | 24.8 | 24.4 |
| Public administration & defence | 25.9 | 25.3 | 24.7 | 24.2 |
| Other services | 23.2 | 25.0 | 25.8 | 26.0 |

The provincial distribution of gross domestic product shows that the Punjab holds the highest share in gross domestic product (52.3 percent); it is followed by Sindh (30.6 percent), NWFP (11.5 percent) and Balochistan (5.5 percent). However, over the years the Punjab's share has declined; during 1970s, about 54 percent of the country's GDP was being generated in the Punjab that declined to 51.8 percent in 2000s. On the other hand, shares of NWFP and Balochistan in total GDP have increased during this period as shown in the following table; there is no significant change in the share of Sindh in total GDP during the period of 1970-2005 (Table 7.1.5).

| **Table 7.1.5 Real GDP – Share of provinces (%)** (1999-00 prices) | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 54.9 | 30.0 | 11.1 | 4.1 |
| 1975-80 | 53.6 | 30.8 | 10.7 | 4.9 |
| 1980-85 | 51.4 | 31.7 | 11.3 | 5.6 |
| 1985-90 | 51.4 | 31.1 | 11.6 | 5.9 |
| 1990-95 | 51.6 | 30.1 | 11.7 | 6.6 |
| 1995-00 | 51.7 | 30.0 | 12.0 | 6.3 |
| 2000-05 | 51.8 | 30.9 | 12.0 | 5.4 |
| Overall | 52.3 | 30.6 | 11.5 | 5.5 |

The provincial distribution of gross domestic product as estimated by this study is significantly different to that estimated by Bengali and Sadaqat (2005). According to Bengali and Sadaqat, the share of the Punjab was 53.2 percent of total GDP during 1972-2000 period and it has increased over time (Table 7.1.6). The share of Sindh was 31.3 percent on average during 1972-00 and it has declined during 1990s. The shares of NWFP and Balochistan have also declined over time. In addition to the difference in base year prices used by the two studies, the difference of results can also be explained by application of different techniques of provincialisation at sectoral level as discussed in detail in the relevant sub-sections of this chapter in pages ahead.

**Table 7.1.6 Real GDP: Bengali and Sadaqat provincial shares** (1980-81 prices)

| | Punjab | Sindh | NWFP | Balochistan |
|---|---|---|---|---|
| 1972-75 | 52.8 | 30.8 | 11.8 | 4.6 |
| 1975-80 | 53.7 | 30.5 | 11.4 | 4.4 |
| 1980-85 | 52.5 | 32.0 | 11.4 | 4.0 |
| 1985-90 | 52.4 | 32.1 | 11.6 | 3.9 |
| 1990-95 | 53.5 | 31.3 | 11.0 | 4.1 |
| 1995-00 | 54.0 | 30.5 | 11.6 | 3.9 |
| Overall | 53.2 | 31.3 | 11.4 | 4.1 |

**Table 7.1.7 Provincial Shares in Value Added – Bengali and Sadaqat results** (average during 1972 to 1990) (1980-81 prices)

| | Punjab | Sindh | Balochistan | NWFP |
|---|---|---|---|---|
| GDP | 53.2 | 31.3 | 11.4 | 4.1 |
| Agriculture | 58.5 | 25.0 | 11.3 | 5.2 |
| Major crops | 62.6 | 24.5 | 11.4 | 1.4 |
| Minor crops | 59.0 | 20.2 | 8.5 | 12.4 |
| Livestock | 59.2 | 22.9 | 12.6 | 5.2 |
| Fishing | 5.9 | 75.1 | 0.3 | 18.7 |
| Forests | 29.2 | 8.0 | 61.6 | 1.3 |
| Industry | 48.9 | 37.7 | 10.2 | 3.2 |
| Mining & Quarrying | 34.2 | 40.5 | 6.1 | 19.2 |
| Manufacturing | 48.6 | 41.5 | 8.6 | 1.3 |
| Construction | 53.0 | 28.8 | 12.1 | 6.1 |
| Electricity & gas distribution | 46.6 | 30.2 | 15.9 | 7.3 |
| Services | 52.0 | 32.0 | 12.1 | 3.9 |
| Transport, storage & communication | 49.8 | 37.7 | 8.5 | 4.0 |
| Wholesale & retail trade | 47.4 | 33.1 | 16.3 | 3.2 |
| Banking & insurance | 48.0 | 42.7 | 7.5 | 1.8 |
| Ownership of dwellings | 57.2 | 28.3 | 9.5 | 5.0 |
| Public administration & defence | 55.4 | 28.1 | 11.4 | 5.1 |
| Other services | 58.5 | 24.4 | 12.7 | 4.3 |

Although the Punjab's share in GDP in absolute terms is the highest, the distribution of per capita GDP is entirely different. The present study finds that Sindh is the richest province in terms per capita GDP and there is significant increase in per capita output during the period; in early 1970s, average per capita GDP (at constant prices of 1999-00) in Sindh was Rs 21.3 thousand that increased to Rs 35.2 thousand in 2000s (Table 7.1.8). The province second on the this scale is Balochistan; it has average per capita output of Rs 28.8 thousand during 2000s, which has increased by over 80% from a level of Rs 16 thousand in early 1970s. The Punjab and NWFP have per capita income of Rs 24.3 thousand and 23.4 thousand during 2000s respectively.

**Table 7.1.8 Per Capita Real GDP (000 Rupees per annum)**
(1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-75 | 14.7 | 21.3 | 13.3 | 16.3 | 16.1 |
| 1975-80 | 15.7 | 23.1 | 13.8 | 17.7 | 17.2 |
| 1980-85 | 17.6 | 27.1 | 16.7 | 21.4 | 19.9 |
| 1985-90 | 20.2 | 30.3 | 19.4 | 26.0 | 22.7 |
| 1990-95 | 21.9 | 31.5 | 21.0 | 31.5 | 24.5 |
| 1995-00 | 22.6 | 32.0 | 21.9 | 31.1 | 25.2 |
| 2000-05 | 24.3 | 35.2 | 23.4 | 28.8 | 27.0 |
| Overall | 19.6 | 28.6 | 18.5 | 24.7 | 21.8 |

The relative position of provinces at the scale of per capita income as comes out from our results is consistent with household integrated economic surveys of different years. As Table 7.1.9 shows, Sindh has been the richest province in terms of average household income per month, followed by NWFP or Balochistan. the Punjab has been at either third or fourth position in the ranking of provinces according to per household income.

**Table 7.1.9 Monthly Income per Household (Rupees) as per HIES***

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1979 | 956 | 1,181 | 1,148 | 1,020 | 1,032 |
| 1985-86 | 1,800 | 2,170 | 1,855 | 1,745 | 1,889 |
| 1996-97 | 3,255 | 4,375 | 3,343 | 3,436 | 3,509 |
| 2001-02 | 6,847 | 8,074 | 6,821 | 7,705 | 7,168 |
| 2004-05 | 9,488 | 10,413 | 9,395 | 8,849 | 9,685 |

* HIES stands for Household Income and Expenditure Survey for years 1979, and 1985-86, for subsequent years the name of this survey is Household Integrated Economic Survey.

Looking at the growth rates of GDP in provinces, Table 7.1.10 shows that Balochistan had been the fastest growing province up till mid 1990s; however, its GDP growth declined significantly since then with negative average growth during second half of 1990s. Bengali and Sadaqat (2005) also find similar growth trend in Balochistan. The province of Sindh has been the second fastest growing area with an average GDP growth of 5 percent followed by NWFP (4.9%). The province of the Punjab has been the slowest growing region during this period. The results may be expected as the provinces with low level of absolute GDP grew faster as compared with those with higher level of GDP. Looking at the average growth rates across time we can observe convergence of provincial growth rates in 1990s; growth rates in 2000s are also almost the same in provinces except Balochistan wherein unfavorable weather conditions of early 2000s affected badly the economic conditions of this province.

**Table 7.1.10 Real GDP Growth in Provinces (%)**(1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-75 | 4.5 | 4.7 | 2.6 | 10.0 | 4.6 |
| 1975-80 | 4.6 | 6.5 | 6.1 | 7.5 | 5.5 |
| 1980-85 | 5.2 | 6.0 | 6.2 | 9.4 | 5.8 |
| 1985-90 | 4.7 | 3.8 | 6.3 | 5.5 | 4.7 |
| 1990-95 | 4.4 | 3.8 | 3.6 | 6.5 | 4.2 |
| 1995-00 | 3.6 | 3.2 | 3.4 | -0.4 | 3.2 |
| 2000-05 | 4.9 | 6.4 | 5.4 | 2.9 | 5.3 |
| Overall | 4.6 | 4.9 | 4.9 | 5.8 | 4.7 |

## 7.2 Agriculture

The gross value added of agriculture sector at 1999-00 prices as estimated by FBS is highly overestimated as compared with estimates of this study. There is a difference of more than 5 percent between the two estimates (Table 7.2.1). This difference is solely due to livestock value added which is grossly overestimated by FBS as argued and explained in detail in section 7.2.3 (coming next). It is interesting to note that the impact of this overestimation of agriculture on overall GDP has been cancelled out by underestimation in industry.

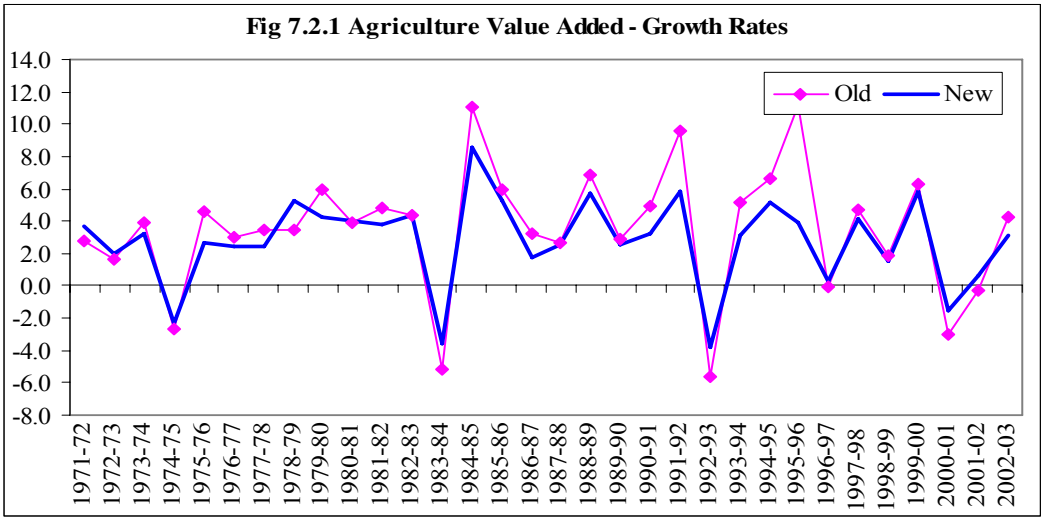
**Table 7.2.1 Agriculture: Comparison of Estimates** (Rs million) (1999-00 prices)

| | Present study's estimates | FBS estimates | % Difference |
|---|---|---|---|
| 1999-00 | 873148 | 923609 | -5.5 |
| 2000-01 | 859370 | 903499 | -4.9 |
| 2001-02 | 864912 | 904433 | -4.4 |
| 2002-03 | 891430 | 943223 | -5.5 |
| 2003-04 | 909138 | 964827 | -5.8 |
| 2004-05 | 977889 | 1029845 | -5.0 |

Compared with old series of national accounts at 1980-81 prices, it is evident that growth rates of agricultural value added at new base prices are different to those at old base (Fig 7.2.1). However, the pattern of movements in both the series is quite a similar. Thus the changes in relative prices have though changed the growth rates in different years, the trend of agriculture value added is almost similar.

The seasonal pattern of agricultural value added shows that 30.5 percent of the value addition takes place in the second quarter which is the quarter of cotton production in Pakistan, followed by the fourth quarter, the quarter of wheat and gram, wherein 28.2 percent of the total value addition takes place (Table 7.2.2). A time series of quarterly value added in agricultural sector is exhibited in Fig 7.2.2 which shows regular ups and downs along with an upward trend in the series. These seasonal factors are significantly different to those computed by Kemal and Arby (2004) for agriculture value at old base of 1980-81. According to Kemal and Arby study, 33.7 percent of the annual value addition is produced in second quarter (about 3 percentage points higher than the estimates of the current study) followed by fourth quarter with 25.6 percent (about 3 percentage points less than estimates of the current study). This indicates significant changes in relative prices.[68]

**Fig 7.2.1 Agriculture Value Added - Growth Rates**

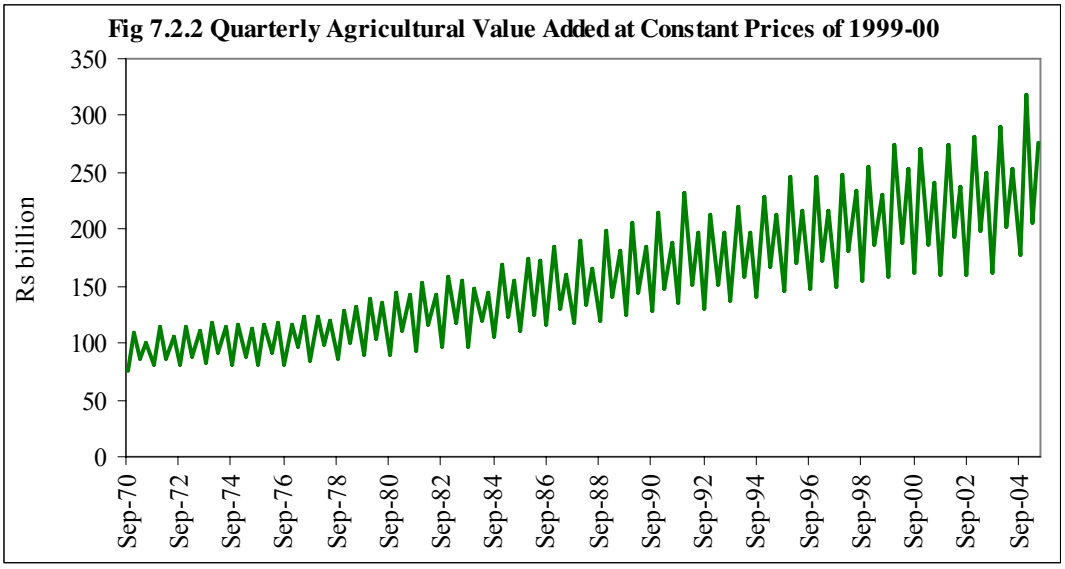



[68] As already given an example of changes in relative prices in chapter 1, note that wheat price to cotton price ratio during 1980-81 (the old base year) was 0.5, while it was 0.9 during 1999-00 (the new base year). A higher relative price of wheat could be a major reason for increase in the share of fourth quarter in agriculture value added.

| **Table 7.2.2 Real Value Added in Agriculture - Seasonal Factors (%)** (1999-00 prices) | | | | |
|---|---|---|---|---|
| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
| 1970-75 | 20.5 | 29.3 | 22.5 | 27.7 |
| 1975-80 | 19.4 | 28.9 | 22.6 | 29.1 |
| 1980-85 | 18.7 | 29.9 | 22.8 | 28.6 |
| 1985-90 | 19.1 | 30.9 | 21.9 | 28.0 |
| 1990-95 | 18.9 | 31.3 | 21.9 | 28.0 |
| 1995-00 | 18.6 | 31.2 | 22.0 | 28.2 |
| 2000-05 | 18.3 | 31.9 | 21.9 | 28.0 |
| Overall | 19.1 | 30.5 | 22.2 | 28.2 |

As expected, the provincial distribution of agriculture value added shows that the Punjab contributes the highest share to total agriculture, less than its half is contributed by Sindh, less than half of Sindh's share is contributed by NWFP and the lowest contribution is by Balochistan (Table 7.2.3). Vast cultivable land, efficient size of land holdings and better water availability have made the Punjab the most value yielding province. However, looking at the dynamics of agriculture value added, it appears that the share of the Punjab overtime has declined. During early 1970s, the Punjab contributed 63 percent of total value added of agriculture which declined to 58 percent during years 2000s. On the other hand the shares of Sindh and Balochistan have increased. The share of NWFP remained stagnant around 11 percent through the period.

**Fig 7.2.2 Quarterly Agricultural Value Added at Constant Prices of 1999-00**



| **Table 7.2.3 Real Value Added in Agriculture - Share of Provinces (%)** (1999-00 prices) | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 63.0 | 22.3 | 11.2 | 3.5 |
| 1975-80 | 61.8 | 23.3 | 10.5 | 4.4 |
| 1980-85 | 59.8 | 23.5 | 11.1 | 5.6 |
| 1985-90 | 60.6 | 22.0 | 11.4 | 6.0 |
| 1990-95 | 59.9 | 21.9 | 11.1 | 7.1 |
| 1995-00 | 57.8 | 24.1 | 10.6 | 7.5 |
| 2000-05 | 58.3 | 24.3 | 11.3 | 6.1 |
| Overall | 60.2 | 23.1 | 11.0 | 5.7 |

The results of this study are broadly similar to Bengali and Sadaqat (2005) both in terms of provincial contributions to agriculture value added and their dynamics (Table 7.2.4).

| **Table 7.2.4 Agriculture: Bengali and Sadaqat Provincial Shares** (1980-81 prices) | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1972-75 | 58.3 | 23.4 | 12.9 | 5.4 |
| 1975-80 | 60.8 | 22.8 | 11.4 | 5.1 |
| 1980-85 | 59.4 | 24.7 | 11.5 | 4.5 |
| 1985-90 | 57.7 | 25.8 | 11.6 | 4.8 |
| 1990-95 | 58.1 | 25.6 | 10.7 | 5.6 |
| 1995-00 | 56.8 | 27.0 | 10.3 | 5.8 |
| Overall | 58.5 | 25.0 | 11.3 | 5.2 |

The growth in provincial value added in agriculture shows that Balochistan had been the fastest growing province during the period 1970-05 followed by Sindh (Table 7.2.5). The average growth rates both in the Punjab and NWFP had been almost the same – below the national average of 3 percent.

| **Table 7.2.5 Real Growth in Agriculture Value Added by Provinces (%)** (1999-00 prices) | | | | | |
|---|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
| 1970-75 | 1.9 | 0.9 | -0.5 | 9.3 | 1.6 |
| 1975-80 | 2.5 | 5.6 | 3.2 | 6.4 | 3.4 |
| 1980-85 | 3.4 | 2.1 | 4.0 | 9.6 | 3.4 |
| 1985-90 | 3.5 | 2.7 | 5.9 | 3.8 | 3.6 |
| 1990-95 | 2.6 | 2.8 | 1.0 | 7.8 | 2.7 |
| 1995-00 | 3.1 | 5.6 | 2.3 | -1.9 | 3.1 |
| 2000-05 | 2.5 | 1.9 | 2.0 | 3.0 | 2.3 |
| Overall | 2.8 | 3.2 | 2.7 | 5.3 | 2.9 |

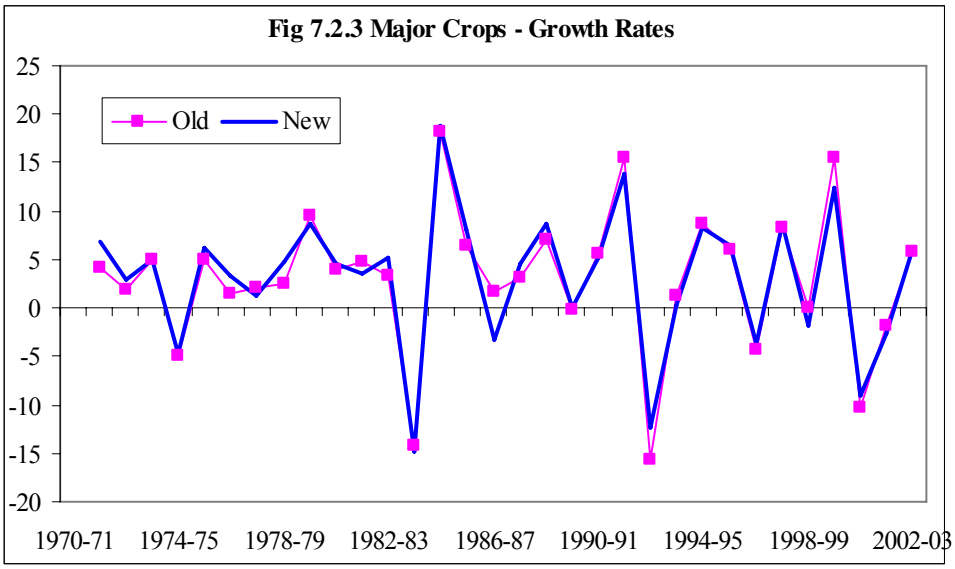
### 7.2.1 Major crops

A comparison of our estimate and FBS estimates of gross value added of major crops at constant prices of 1999-00 are given in Table 7.2.6. The table shows that there is almost no difference between the two estimates which gives a great deal of confidence on estimates of this study for past years at new base of 1999-00.

**Table 7.2.6 Major Crops: Comparison of Estimates** (Rs million) (1999-00 prices)

| | Present study's estimates | FBS estimates | % Difference |
|---|---|---|---|
| 1999-00 | 342,004 | 342,200 | -0.1 |
| 2000-01 | 310,914 | 308,474 | 0.8 |
| 2001-02 | 302,923 | 300,911 | 0.7 |
| 2002-03 | 321,331 | 321,038 | 0.1 |
| 2003-04 | 328,607 | 327,057 | 0.5 |
| 2004-05 | 384,443 | 385,119 | -0.2 |

Compared with the growth rates of old series (at 1980-81 base), the new growth rates have similar trend over the years (Fig 7.2.3).




The seasonal pattern of value added of major crops mainly depends on two key crops of Pakistan, viz., cotton and wheat. More than two third of major crops value added takes place in second (cotton season) and fourth (wheat season) quarters. During 1970s, about 33 percent of the annual value added in major crops was produced in the second quarter which increased to 37.6 percent in years 2000s (Table 7.2.7). On the other hand fourth quarter has maintained its share of above 40 percent in annual value added. The gross value added of the major crops is the lowest in the first quarter (9 percent).

| **Table 7.2.7 Major Crops: Average Seasonal Factors** (1999-00 prices) % | | | | |
|---|---|---|---|---|
| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
| 1970-75 | 10.1 | 34.7 | 15.4 | 39.8 |
| 1975-80 | 8.8 | 32.3 | 16.0 | 43.0 |
| 1980-85 | 8.4 | 33.9 | 15.4 | 42.3 |
| 1985-90 | 9.9 | 36.4 | 13.0 | 40.7 |
| 1990-95 | 9.5 | 36.7 | 13.1 | 40.7 |
| 1995-00 | 9.1 | 36.1 | 13.5 | 41.3 |
| 2000-05 | 9.1 | 37.6 | 12.3 | 41.0 |
| Overall | 9.3 | 35.4 | 14.1 | 41.2 |

Coming towards the provincial distribution of the gross value added of major crops, it is found that it is highly concentrated in the Punjab with 68 percent of the total value added coming from this province. The province of Sindh produces about 21 percent of the total major crops followed by NWFP (7.8%) and Balochistan (2.7%). Over the years the share of the Punjab and Balochistan have increased while those of Sindh and NWFP have declined (Table 7.2.8).

| **Table 7.2.8 Major Crops: Average Shares of Provinces** (1999-00 prices) % | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 66.5 | 24.0 | 8.5 | 1.0 |
| 1975-80 | 66.3 | 23.8 | 8.7 | 1.2 |
| 1980-85 | 63.9 | 24.3 | 8.6 | 3.2 |
| 1985-90 | 68.6 | 20.2 | 8.1 | 3.2 |
| 1990-95 | 69.7 | 18.8 | 7.9 | 3.6 |
| 1995-00 | 68.3 | 21.1 | 7.0 | 3.6 |
| 2000-05 | 74.7 | 16.8 | 5.5 | 3.0 |
| Overall | 68.3 | 21.3 | 7.8 | 2.7 |

In terms of growth rates, Balochistan has showed the highest average growth in major crops during the period of 1970-2005 (Table 7.2.9). As the outcome of crops entirely depend on weather conditions so it is hard to find any systematic movements in the growth rates over time.

| **Table 7.2.9 Major Crops: Average Growth Rates** (1999-00 prices) % | | | | | |
|---|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
| 1970-75 | 3.3 | 2.5 | 5.6 | 10.0 | 3.2 |
| 1975-80 | 4.4 | 5.2 | 3.0 | 17.6 | 4.5 |
| 1980-85 | 5.7 | 0.1 | 1.7 | 21.0 | 4.1 |
| 1985-90 | 3.2 | 1.8 | 4.5 | 7.4 | 3.0 |
| 1990-95 | 3.3 | 5.1 | 0.6 | 8.2 | 3.3 |
| 1995-00 | 2.9 | -0.3 | -4.8 | -5.8 | 1.3 |
| 2000-05 | 6.5 | 3.0 | 3.4 | 5.1 | 5.7 |
| Overall | 4.1 | 2.5 | 2.0 | 9.2 | 3.5 |

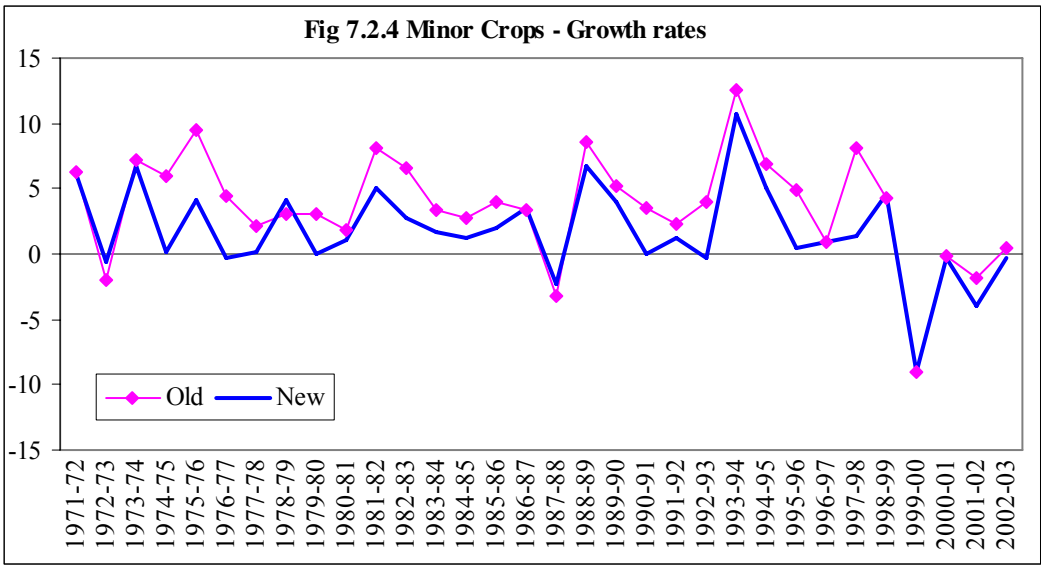
### 7.2.2 Minor Crops

A comparison of the gross value added of minor crops as estimated by this study and that by FBS for the period 1999-00 to 2004-05 has been given in Table 7.2.10. Although the there is no difference between the two estimates for benchmark year (1999-00), there are differences for other years. These differences, though small, may be due to lower coverage of minor crops in this study due to lack of past data for all minor crops as compared with the coverage by FBS.

**Table 7.2.10 Minor Crops: Comparison of Estimates** (Rs million) (1999-00 prices)

| | Present study's estimates | FBS estimates | % Difference |
|---|---|---|---|
| 1999-00 | 125,680 | 125,679 | 0.00 |
| 2000-01 | 125,274 | 121,673 | 2.96 |
| 2001-02 | 120,199 | 117,217 | 2.54 |
| 2002-03 | 119,910 | 119,359 | 0.46 |
| 2003-04 | 121,863 | 124,121 | -1.82 |
| 2004-05 | 128,137 | 127,822 | 0.25 |

Comparing the new growth rates (at 1999-00 prices) with old ones, Fig 7.2.4 shows that new rates are generally lower than old ones.




The disaggregation of minor crops value added into four quarters reveals that the highest production of minor crops takes place in the first quarter (36%) and the lowest production is in the fourth quarter (19%). These results are sensible as the period when major crops are not grown, minor crops are grown in order to maintain the flow of income for formers to some extent.

| **Table 7.2.11 Minor Crops: Average Seasonal Factors** (1999-00 prices) % | | | | |
|---|---|---|---|---|
| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
| 1970-75 | 38.4 | 18.1 | 23.6 | 20.0 |
| 1975-80 | 36.8 | 19.5 | 24.0 | 19.7 |
| 1980-85 | 35.6 | 20.4 | 25.1 | 18.9 |
| 1985-90 | 36.2 | 20.4 | 25.0 | 18.4 |
| 1990-95 | 36.6 | 20.4 | 24.6 | 18.3 |
| 1995-00 | 35.9 | 20.8 | 24.6 | 18.8 |
| 2000-05 | 35.9 | 20.4 | 24.4 | 19.3 |
| Overall | 36.1 | 20.4 | 24.7 | 18.8 |

According to the disaggregation of value added into provinces, the Punjab has the major share in minor crops (55 percent) followed by Sindh (24.3 percent), Balochistan (12%) and NWFP (8.7%). As shown in Table 7.2.12, the share of both Sindh and the Punjab have declined overtime while that of Balochistan showed more than 100 percent increase in the period of 35 years (1970-2005).

| **Table 7.2.12 Minor Crops: Provincial Shares** (1999-00 prices) % | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 60.3 | 28.7 | 5.9 | 5.1 |
| 1975-80 | 55.5 | 29.8 | 8.3 | 6.4 |
| 1980-85 | 55.8 | 27.9 | 8.5 | 7.8 |
| 1985-90 | 56.1 | 25.2 | 9.2 | 9.5 |
| 1990-95 | 55.2 | 20.7 | 8.7 | 15.5 |
| 1995-00 | 53.1 | 20.7 | 7.8 | 18.4 |
| 2000-05 | 55.0 | 23.4 | 9.3 | 12.4 |
| Overall | 55.0 | 24.3 | 8.7 | 12.0 |

As in the case of major crops, Balochistan has showed highest growth rates also in minor crops (5%). Sindh and the Punjab have witnessed an average growth of less than 2 percent in gross value added of minor crops. Although average growth rate in Balochistan is high, there are wide variations in the growth rates (Table 7.2.13).

| **Table 7.2.13 Minor Crops: Average Growth in Provincial Value Added (%)** (1999-00 prices) | | | | | |
|---|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
| 1970-75 | 2.6 | 0.9 | 11.5 | 23.6 | 3.1 |
| 1975-80 | -0.5 | 4.0 | 6.8 | 4.4 | 1.6 |
| 1980-85 | 3.5 | -0.7 | 0.9 | 8.3 | 2.4 |
| 1985-90 | 2.5 | 1.6 | 5.5 | 6.4 | 2.8 |
| 1990-95 | 2.4 | -2.5 | 1.7 | 18.2 | 3.4 |
| 1995-00 | 0.3 | 5.1 | 0.9 | -7.8 | -0.4 |
| 2000-05 | 0.5 | -0.2 | 0.4 | 2.0 | 0.4 |
| Overall | 1.7 | 0.9 | 1.9 | 5.0 | 1.7 |

### 7.2.3 Livestock

There are significant differences in the livestock value added as estimated by this study and that by FBS. The main difference lies in different population of animals used in the two estimates. The estimation technique of livestock population as adopted in this study along with problems with population used by FBS (estimates of MinFAL) is given in Annexure B. The Table 7.2.14 outlines difference in different heads of the two estimates for benchmark year (1999-00). The overall difference in gross value added is 11.9 percent.

**Table 7.2.14 Livestock: Comparison of Estimates for 1999-00**

(Rs million)

| | Present studies estimate | FBS estimate | Difference | |
|---|---|---|---|---|
| | | | absolute | %age |
| Natural Growth | 19863 | 39569 | -19706 | -49.8 |
| Net Sales | 73667 | 128757 | -55090 | -42.8 |
| Milk | 292348 | 278178 | 14170 | 5.094 |
| Draught Power | 15963 | 18590 | -2627 | -14.1 |
| Dung & Urine | 28145 | 27698 | 447 | 1.615 |
| Wool & Hair | 1509 | 1501 | 8 | 0.566 |
| Poultry | 42932 | 42933 | -1 | -0 |
| Gross Value | 474428 | 537226 | -62798 | -11.7 |
| Inputs | 107019 | 120106 | -13087 | -10.9 |
| Value Added | 367409 | 417120 | -49711 | -11.9 |

Some specific reasons for these differences are given below.

***Natural Growth:***

Gross value of Natural growth has been calculated by applying base year prices of young animals (Reference: FBS 2004, Annexure 20) on population of animals of age less than 1 year. In census data, population with age of less than one year is available only for sheep and goats; for other animals, less than 3 years population is reported. This study has worked out less than one year population as one third of the less than 3 years population which does not seem implausible. However, FBS (2004) estimates this population (for the year 1999-00) as below:

***Cattle:***

Actual number of young bulls < 3 years of age = 3844

FBS estimate of young bulls < 1 year of age = 3005(78%)

Actual number of young cows < 3 years of age = 3410
FBS estimates of young cows < 1 years of age = 2544 (85%)

***Buffaloes:***
Actual number of young bulls < 3 years of age = 3674
FBS estimates of young bulls < 1 year of age = 3131 (85%)

Actual number of young buff < 3 years = 4936
FBS estimates of young buff < 1 years = 3613 (73%)

These ratios are unbelievable (almost 2/3 of total population of less than 3 years); these are also not consistent with FBS's own study on Livestock, p 14 & 21 (FBS, 2002e).

There also seems another error in FBS estimates; Annexure 20 of Rebasing Book (FBS, 2004) reports number of sheep and goats below 1 year age as 12,468 and 27,601 respectively which are significantly higher than those given in its own table of Annexure 18 of the same book.

→ Thus due to overestimation of population less than 1 year by FBS, its estimates are higher than our estimates.

***Net Sales***
Sales of animals can be for two purposes, i.e. for slaughtering and for activities within livestock sector (e.g. draught power, breeding, milk, transport, etc). In "Net sales", sale for slaughtering is included. We have worked out number of animals slaughtered in a year as below;

$S_t = Y_{t-1} + X_t - Y_t$
Where $S_t$ is animal slaughtered in year $t$, $Y_{t-1}$ is number of animals during previous year, $X_t$ is number of animals born during year $t$ (animals of age less than 1 year), and $Y_t$ is total number of animals during year $t$.

With this logical formula, our number of animal slaughtered for the year 1999-00 comes out to be 24843 while FBS uses a number of 43950 (Annexure 19 of Rebasing Book) which is very high. This number is not consistent with FBS own publication on Slaughtering, page 12 (FBS, 2002f). We have also cross-checked Provincial Development Statistics and found our estimates closer to them.

→ Due to gross overestimation by FBS of number of slaughtered animals, its estimates of Net Sales are very high as compared with this study

***Milk***

→ The estimates of this study are higher than FBS estimates because its estimated population of milk animals is higher (as indicated in Annexure B).

***Draught Power***

→ On the other hand, this study estimates number of animals used for draught power less than that by FBS (as indicated in Annexure B).

***Dung & Urine***

→ Dung & urine is also estimated according to the methodology given in the Rebasing book. However, our estimates are slightly higher, possibly due to higher population of adult animals.

***Wool & Hair***

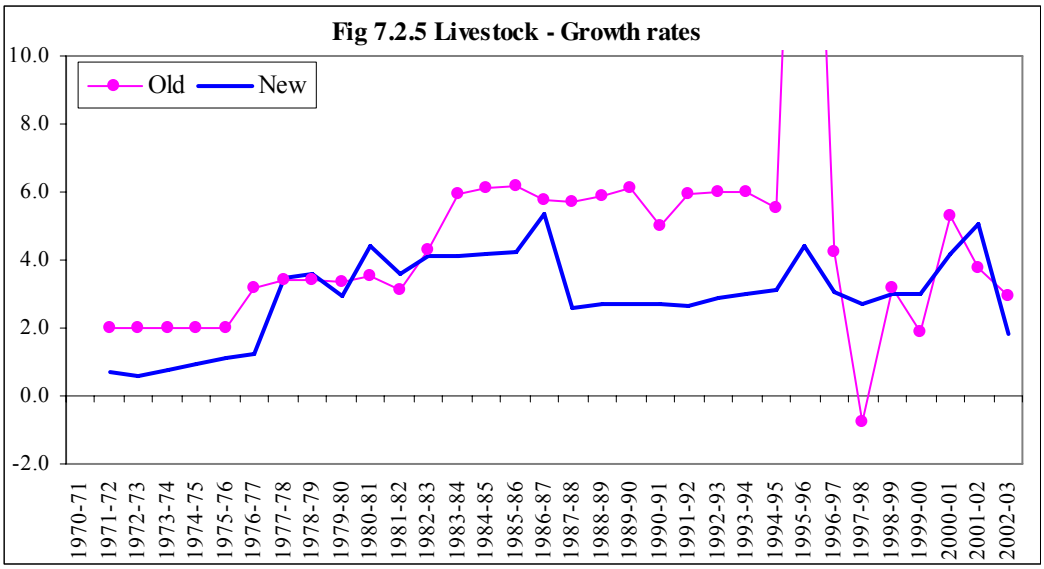
→ The methodology is the same as given by Rebasing book; thus estimates are also similar.

***Poultry***

→ Value of Eggs and chickens and ducks at 1999-00 prices are worked out on the basis of splicing; the two estimates are almost the same.

The livestock value added estimated by this study is also different from old estimates of FBS at base 1980-81; the reason being the same, i.e. different estimates of animal population. These differences are reflected in growth rates of value added given in Fig

7.2.5. In the old series, the growth rate in 1995-96 was very high (26.4 percent) which was only due to the fact FBS did not adjust its previous estimates in the light of new census of livestock population conducted in 1996. More specifically, prior to 1996, FBS had been extrapolating livestock population on the basis of inter-census growth rate of 1986 over 1976 (the two census years). When the numbers of new census of 1996 were available, it simply adopted it from year 1996 onward which caused a sudden jump in its estimates of value added. There is no reason to believe that livestock population suddenly increased by more than 26 percent in a single year. Thus the present study takes into account these changes which resulted in plausible growth rate of livestock value added for this year.




The variations in livestock value added within a year mainly depend on the seasonal pattern of milk production which is a dominant item in this sector. Thus the highest production of livestock sector is in second and third quarters with shares of 31% and 28% respectively as the milk production increase in winter season (Table 7.2.15). Livestock production in each of the first and last quarters is 21 percent.

**Table 7.2.15 Livestock: Quarterly Seasonal Factors** (1999-00 prices) %

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
|---|---|---|---|---|
| 1970-75 | 21.2 | 30.0 | 27.5 | 21.2 |
| 1975-80 | 21.0 | 30.3 | 27.6 | 21.0 |
| 1980-85 | 20.8 | 30.7 | 27.8 | 20.8 |
| 1985-90 | 20.7 | 30.8 | 27.9 | 20.7 |
| 1990-95 | 20.5 | 31.0 | 28.0 | 20.5 |
| 1995-00 | 20.5 | 31.1 | 28.0 | 20.5 |
| 2000-05 | 20.3 | 31.3 | 28.1 | 20.3 |
| Overall | 20.6 | 30.9 | 27.9 | 20.6 |

According to provincial distribution of livestock value added, the share of the Punjab comes out the highest (55 percent) followed by Sindh (24 percent), NWFP (13.5 percent) and Balochistan (7%). Over the years, the shares of the Punjab and NWFP have declined while the shares of Sindh and Balochistan have increased.

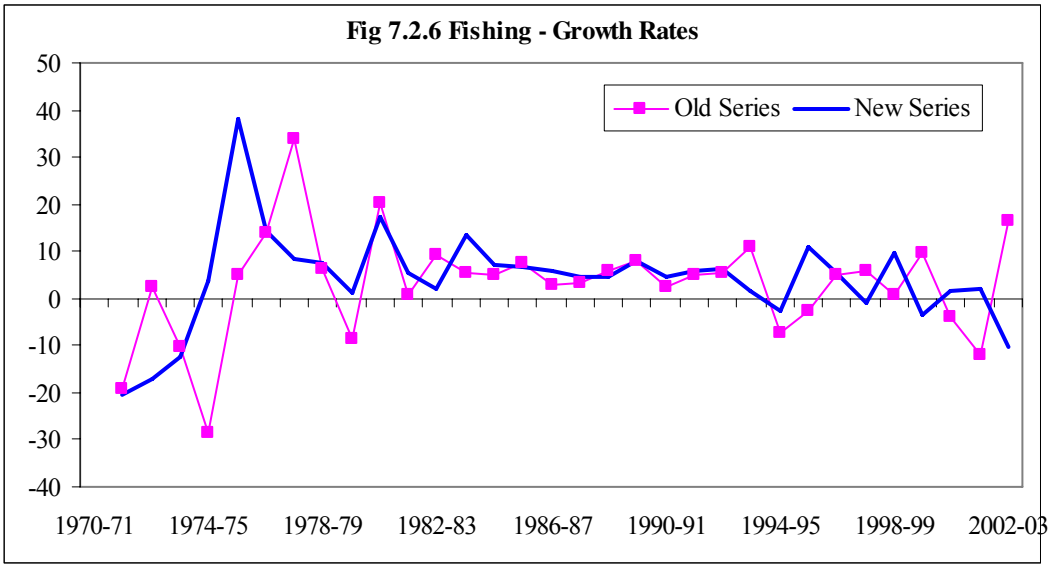
| **Table 7.2.16 Livestock: Provincial Shares** (1999-00 prices) % | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 63.5 | 17.1 | 14.4 | 5.0 |
| 1975-80 | 62.6 | 19.2 | 12.0 | 6.2 |
| 1980-85 | 60.2 | 20.2 | 12.7 | 6.9 |
| 1985-90 | 57.5 | 21.8 | 13.4 | 7.3 |
| 1990-95 | 54.7 | 24.4 | 13.8 | 7.1 |
| 1995-00 | 51.7 | 27.1 | 14.3 | 6.9 |
| 2000-05 | 48.5 | 30.3 | 14.2 | 7.0 |
| Overall | 55.3 | 24.2 | 13.5 | 7.0 |

### 7.2.4 Fishing

There are wide differences in gross value added of fishing as estimated by FBS and those by this study. FBS figures are overestimated for benchmark year of 1999-00 and underestimated for other years. FBS uses figures of both inland and marine fish higher than actual for 1999-00 as reported in Agricultural Statistics of Pakistan. The figures they used actually correspond to 1998-99 as per Agricultural Statistics of Pakistan; this is why the present study estimates of 1998-99 exactly match FBS estimate for 1999-00. However, even if FBS estimates are compared with this study estimates with one year lag, there are wide differences for years 2001-02 and 2002-03 (Table 7.2.17).

| **Table 7.2.17 Fishing: Comparison of Estimates - Rs million** (1999-00 prices) | | | | |
|---|---|---|---|---|
| | Present study's estimates | FBS estimates | % Difference | % Difference with one year lag |
| 1998-99 | 15164 | | | |
| 1999-00 | 14608 | 15163 | -3.7 | 0.01 |
| 2000-01 | 14861 | 14715 | 1.0 | -0.72 |
| 2001-02 | 15170 | 12901 | 17.6 | 15.19 |
| 2002-03 | 13611 | 13346 | 2.0 | 13.66 |
| 2003-04 | 13916 | 13,611 | 2.2 | 0.00 |
| 2004-05 | 14185 | 13,916 | 1.9 | 0.00 |

When compared with the old base series of fishing, the new growth rates do not exactly follow their trend (Fig 7.2.6); however, looking at decade wise averages, it appears the average growth rates have similar movements across the decades, i.e., low in 1970s, high in 1980s, low in 1990s, and further low in 2000s.




The seasonality as determined in this study shows that fishing value added is lowest in the first quarter (15%); it is possibly due to the fact that fishing activities slow down during this period because summer is the season of reproduction of fish. In winter (second and third quarters) the fishing value added is the highest (Table 7.2.18).

**Table 7.2.18 Fishing: Seasonal Factors (1999-00 prices)**

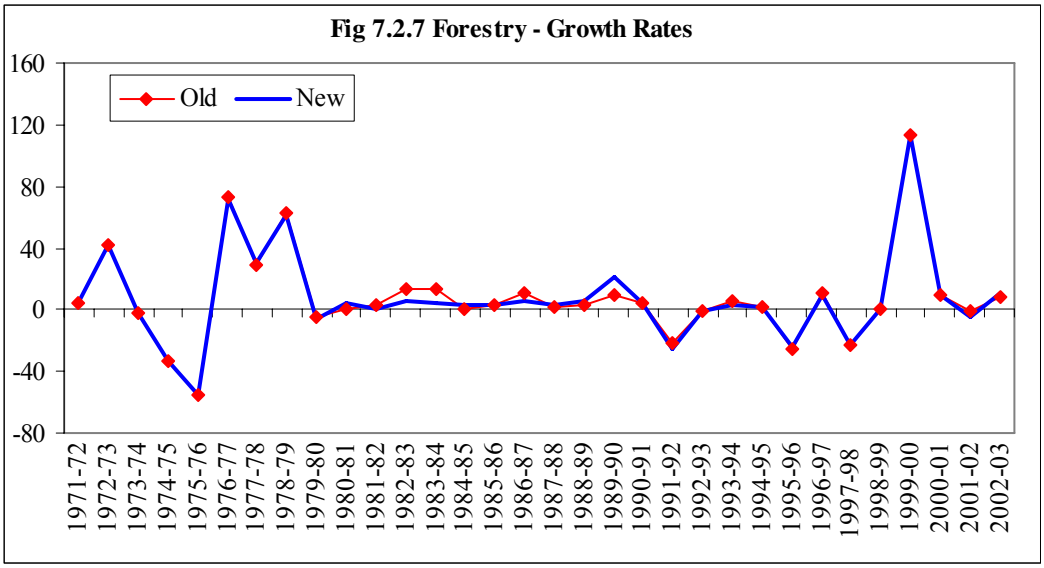
| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
|---|---|---|---|---|
| 1970-75 | 17.1 | 29.6 | 27.5 | 25.9 |
| 1975-80 | 15.7 | 29.0 | 29.2 | 26.0 |
| 1980-85 | 15.1 | 28.8 | 30.1 | 26.1 |
| 1985-90 | 14.5 | 28.6 | 30.7 | 26.1 |
| 1990-95 | 14.5 | 28.6 | 30.9 | 26.1 |
| 1995-00 | 13.9 | 28.4 | 31.6 | 26.2 |
| 2000-05 | 13.8 | 28.3 | 31.7 | 26.2 |
| Overall | 14.9 | 28.7 | 30.2 | 26.1 |

As regards the provincial origin of fishing value added, it is mostly coming from Sindh which have two third of the total value added in the country. The Punjab generates about one fourth of the total value added consisting entirely of land fishing. Balochistan has a share of 10.8 percent while NWFP has about 1 percent share in total value added of fishing (Table 7.2.19).

| **Table 7.2.19 Fishing: Provincial Share** (1999-00 prices) | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 7.5 | 80.0 | 0.5 | 12.0 |
| 1975-80 | 15.0 | 68.9 | 2.6 | 13.5 |
| 1980-85 | 20.2 | 66.9 | 0.7 | 12.3 |
| 1985-90 | 26.6 | 62.3 | 0.6 | 10.4 |
| 1990-95 | 29.8 | 59.1 | 1.3 | 9.9 |
| 1995-00 | 26.0 | 64.6 | 0.4 | 8.9 |
| 2000-05 | 25.8 | 64.4 | 0.8 | 9.0 |
| Overall | 21.6 | 66.6 | 1.0 | 10.8 |

### 7.2.5 Forestry

By construction our estimates of gross value added of forestry exactly match the FBS estimates Moreover, the new growth rates also follow the path of old ones in general (Fig 7.2.7).




The quarterly estimates of forestry value added have been made according to the seasonal factors suggested by Quaidian Economic Consultants (2002) as already mentioned in the section 5.1.4.

Regarding provincialisation, the results show that the Punjab has the highest share in forestry (45.8 percent) followed by NWFP (42.4 percent), Sindh (10.7 percent) and Balochistan 1% (Table 7.2.20).

| **Table 7.2.20 Forestry: Provincial Shares** (1999-00 prices) % | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 44.7 | 14.5 | 39.8 | 1.0 |
| 1975-80 | 47.0 | 13.9 | 38.0 | 1.1 |
| 1980-85 | 41.4 | 13.2 | 44.4 | 1.0 |
| 1985-90 | 45.1 | 10.2 | 43.7 | 1.1 |
| 1990-95 | 49.4 | 11.1 | 38.5 | 1.0 |
| 1995-00 | 54.6 | 7.3 | 36.3 | 1.8 |
| 2000-05 | 38.4 | 4.9 | 56.1 | 0.6 |
| Overall | 45.8 | 10.7 | 42.4 | 1.1 |

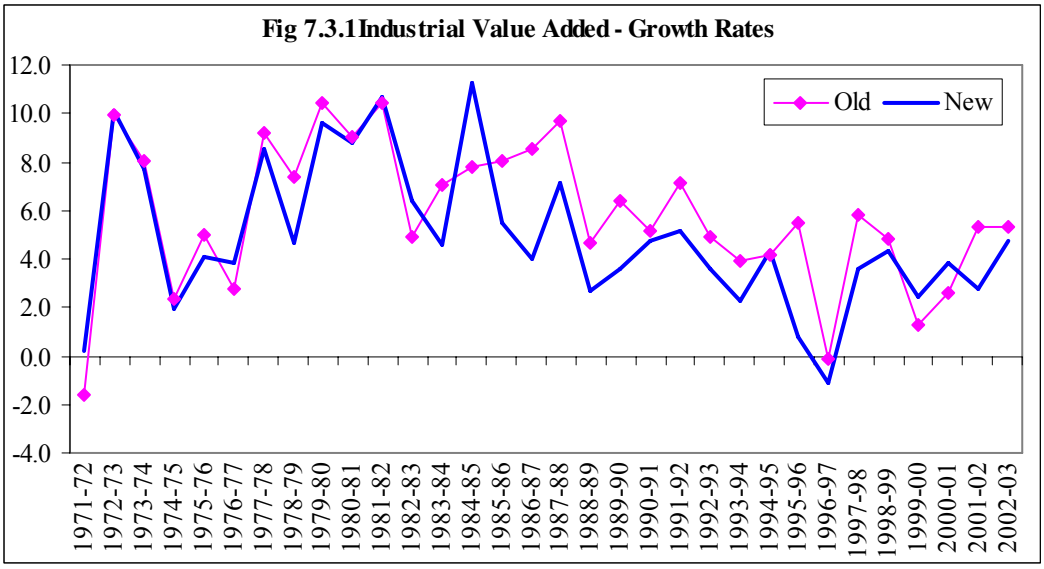
## 7.3 Industry

Gross value added of industry as estimated by this study is higher than FBS estimates for years 1999-00 onwards (Table 7.3.1). As against agriculture, FBS estimates of industrial value added are underestimated due solely to slaughtering. Since slaughtering, a small-scale industry, uses inputs from livestock which was highly overestimated by FBS, its value added was suppressed due to high input cost. If slaughtering is excluded from industry, then both the estimates are fairly close.

| **Table 7.3.1 Industry: Comparison of Estimates -** Rs million (1999-00 prices) | | | |
|---|---|---|---|
| | Present study's estimates | FBS estimates | % Difference |
| 1999-00 | 850,213 | 830,865 | 2.3 |
| 2000-01 | 882,635 | 865,196 | 2.0 |
| 2001-02 | 907,269 | 888,539 | 2.1 |
| 2002-03 | 950,478 | 926,183 | 2.6 |
| 2003-04 | 1,090,392 | 1,076,808 | 1.3 |
| 2004-05 | 1,206,103 | 1,199,664 | 0.5 |

While comparing the growth rate of industrial value at new base with those at old base of 1980-81, it is found that both the series move in a similar fashion, though some differences are visible (Table 7.3.2 and Fig 7.3.1). For example, for the period after mid 1980s, the new growth rates remained generally below the old growth rates. The main reason for lower growth exhibited by industry is lower growth in large-scale manufacturing.

| **Table 7.3.2 Industry: Old and New Growth Rates - averages** | | |
|---|---|---|
| | Old Base (1980-81) | New Base (1999-00) |
| 1970-75 | 4.7 | 5.0 |
| 1975-80 | 7.0 | 6.1 |
| 1980-85 | 7.8 | 8.3 |
| 1985-90 | 7.5 | 4.6 |
| 1990-95 | 5.1 | 4.0 |
| 1995-00 | 3.5 | 2.0 |
| 2000-05* | 4.4 | 7.3 |
| Overall | 5.8 | 5.4 |
| * Growth of old base data is for 2000-03 | | |

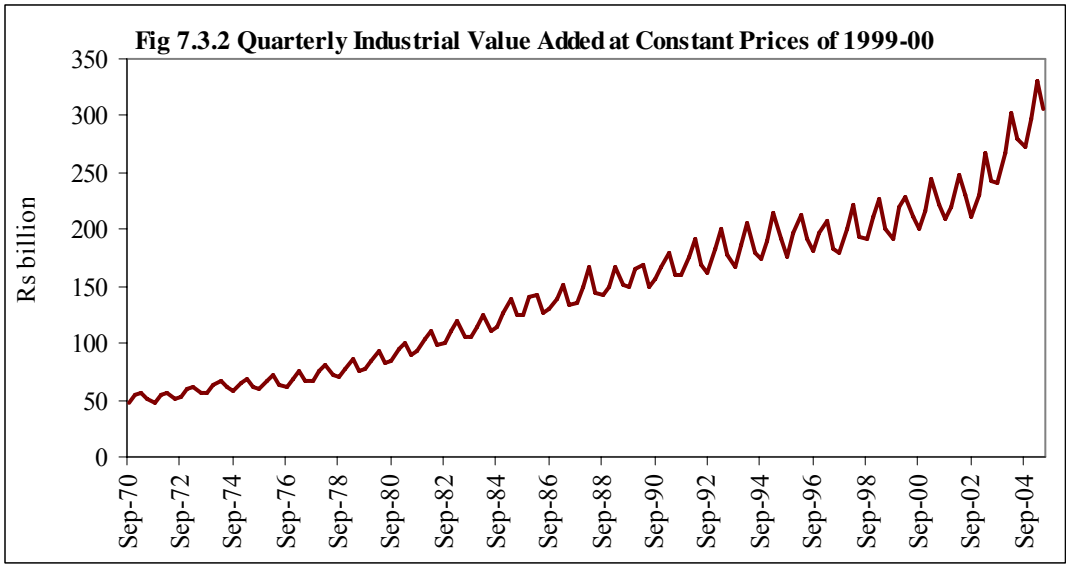



It is interesting to find that in comparison to agriculture, the industrial value added show lesser seasonal variations in a year: the first quarter of the year produces 22.9 percent of the gross value added of industry which is the lowest; the highest value added is produced in third quarter (27.4 percent) when textile industry is in full operation along with sugar industry (Table 7.3.3). The gap between lowest and highest seasonal factors of industry is thus 4 percentage points compared with 11 percentage points in case of agriculture.

**Table 7.3.3 Real Value Added in Industry -** Seasonal Factors (%)
(1999-00 prices)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
|---|---|---|---|---|
| 1970-75 | 23.0 | 25.7 | 27.0 | 24.3 |
| 1975-80 | 22.9 | 25.3 | 27.5 | 24.4 |
| 1980-85 | 23.0 | 25.3 | 27.4 | 24.3 |
| 1985-90 | 23.3 | 25.4 | 27.2 | 24.1 |
| 1990-95 | 22.9 | 25.1 | 27.6 | 24.4 |
| 1995-00 | 22.9 | 25.5 | 27.3 | 24.4 |
| 2000-05 | 22.5 | 24.4 | 27.7 | 25.4 |
| Overall | 22.9 | 25.3 | 27.4 | 24.5 |

The second and fourth quarters each produces about one fourth of the annual value added of the sector. A time series of quarterly value added in industry is exhibited in Fig 7.3.2 which shows that amplitude of seasonal factors has been changing slightly over the years.




Bengaliwala (1995) also found similar seasonal factors for industrial value added, however, with the gap between lowest and highest seasonal factor being slightly greater than this study.

**Table 7.3.4 Real Value Added in Industry -** Share of Provinces (%)
(1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan |
|---|---|---|---|---|
| 1970-75 | 49.5 | 37.1 | 9.0 | 4.4 |
| 1975-80 | 50.0 | 35.8 | 8.7 | 5.5 |
| 1980-85 | 47.2 | 37.5 | 9.5 | 5.9 |
| 1985-90 | 47.4 | 37.2 | 9.7 | 5.7 |
| 1990-95 | 48.6 | 34.7 | 10.1 | 6.7 |
| 1995-00 | 49.3 | 34.2 | 10.8 | 5.7 |
| 2000-05 | 49.1 | 34.8 | 10.7 | 5.4 |
| Overall | 48.7 | 35.9 | 9.8 | 5.6 |

The provincial distribution of industrial value added shows that the Punjab contributes the most to industries (48.7 percent) followed by Sindh (35.9 percent). The contribution of other two provinces to national value added of industry is very low (Table 7.3.4).It is found that over the years there is no significant change in the distribution of industrial value added in provinces. Bengali and Sadaqat (2005) also came up with similar results (Table 7.3.5).

| **Table 7.3.5 Industry: Bengali and Sadaqat Provincial Shares (%)** (1980-81 prices) | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1972-75 | 50.2 | 37.7 | 9.4 | 2.8 |
| 1975-80 | 49.5 | 37.9 | 9.5 | 3.1 |
| 1980-85 | 46.0 | 40.9 | 9.9 | 3.2 |
| 1985-90 | 47.3 | 38.6 | 10.8 | 3.3 |
| 1990-95 | 50.3 | 36.3 | 9.6 | 3.8 |
| 1995-00 | 50.4 | 35.0 | 11.5 | 3.0 |
| Overall | 48.9 | 37.7 | 10.2 | 3.2 |

In terms of growth rates, it is found that average growth in all the provinces is almost the same (Table 7.3.6). It is interesting to note that all the provinces showed higher average growth in industrial value added compared with overall GDP growth (which has already been reported in Table 7.1.10).

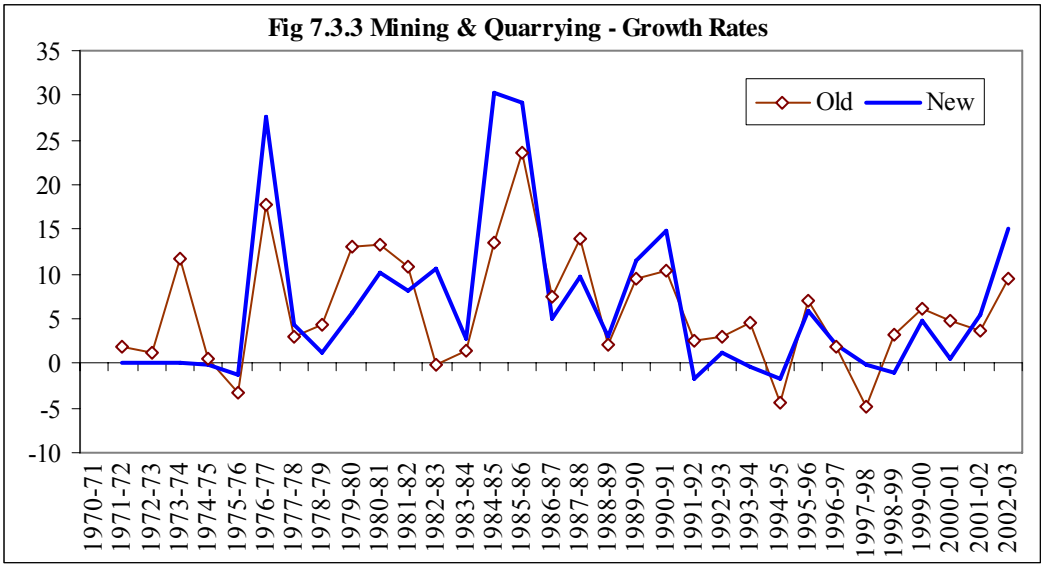
| **Table 7.3.6 Real Growth in Industry Value Added by Provinces (%)** (1999-00 prices) | | | | | |
|---|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
| 1970-75 | 5.02 | 4.83 | 3.85 | 8.94 | 5.01 |
| 1975-80 | 6.25 | 5.44 | 6.06 | 10.10 | 6.13 |
| 1980-85 | 6.95 | 9.81 | 10.07 | 8.36 | 8.34 |
| 1985-90 | 5.00 | 3.81 | 5.37 | 5.12 | 4.59 |
| 1990-95 | 4.42 | 2.68 | 5.20 | 6.89 | 4.02 |
| 1995-00 | 2.53 | 1.65 | 2.87 | -1.22 | 2.01 |
| 2000-05 | 6.96 | 8.54 | 6.84 | 4.27 | 7.34 |
| Overall | 5.31 | 5.26 | 5.81 | 5.98 | 5.36 |

### 7.3.1 Mining & quarrying

The values of gross value added of mining and quarrying as estimated in this study are almost the same as estimated by FBS (Table 7.3.7). Slight differences in some of the years are either just statistical discrepancy or result of a little difference in the coverage as past data of some of the minerals is not available like chalk, bentonite, dolomite, red oxide, granite, etc. However, the share of such mineral items is very small.

| **Table 7.3.7 Mining & Quarrying: Comparison of Estimates** (Rs Million) | | | |
|---|---|---|---|
| | Present study's estimates | FBS estimates | % Difference |
| 1999-00 | 48315 | 48377 | -0.1 |
| 2000-01 | 48604 | 47561 | 2.2 |
| 2001-02 | 51249 | 51031 | 0.4 |
| 2002-03 | 58969 | 59266 | -0.5 |
| 2003-04 | 61477 | 61509 | -0.1 |
| 2004-05 | 64917 | 64609 | 0.5 |

Comparing new based series with the old one, the study finds that the old growth rates and new growth rates follow the same pattern over the years (Fig 7.3.3), however, there differences in absolute numbers.




The study finds that the mining activities are lowest in the first quarter (July-September), with 23.6 percent of the annual value added. In fourth quarter, the value added is the highest with an average share of 25.8 percent (Table 7.3.8).

**Table 7.3.8 Mining & Quarrying: Seasonal Factors –** (1999-00 prices)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
|---|---|---|---|---|
| 1970-75 | 24.4 | 24.0 | 25.5 | 26.0 |
| 1975-80 | 22.9 | 25.0 | 26.2 | 25.9 |
| 1980-85 | 22.4 | 25.2 | 26.2 | 26.2 |
| 1985-90 | 23.7 | 24.7 | 25.8 | 25.8 |
| 1990-95 | 23.7 | 25.3 | 25.9 | 25.1 |
| 1995-00 | 24.0 | 25.4 | 25.7 | 24.9 |
| 2000-05 | 24.4 | 25.2 | 24.2 | 26.3 |
| Overall | 23.6 | 25.0 | 25.6 | 25.8 |

In total gross value added of mining and quarrying, the share of Sindh increased considerably over time: During early 1970s, the share of Sindh was below 20 percent while the Punjab and Balochistan each contributed about 40 percent. However, currently the Sindh's share has increased to more than 50 percent and the shares of the Punjab and Balochistan declined (Table 7.3.9).

| Table 7.3.9 Mining & Quarrying: Provincial Shares (%) | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | N.W.F.P. | Balochistan |
| 1970-75 | 40.9 | 18.2 | 0.6 | 40.2 |
| 1975-80 | 45.1 | 14.9 | 1.5 | 38.5 |
| 1980-85 | 35.6 | 24.7 | 1.6 | 38.2 |
| 1985-90 | 36.9 | 37.7 | 2.7 | 22.7 |
| 1990-95 | 30.9 | 45.8 | 3.2 | 20.1 |
| 1995-00 | 28.0 | 48.9 | 4.2 | 18.9 |
| 2000-05 | 25.0 | 52.1 | 5.3 | 17.6 |
| Overall | 34.6 | 34.6 | 2.7 | 28.0 |

NWFP has shown an impressive growth rate in the gross value added of mining and quarrying though its share is still very low. The growth in Sindh is also high (11 percent) which helped it to increase its share in total value added. The lowest growth has been in Balochistan (Table 7.3.10).

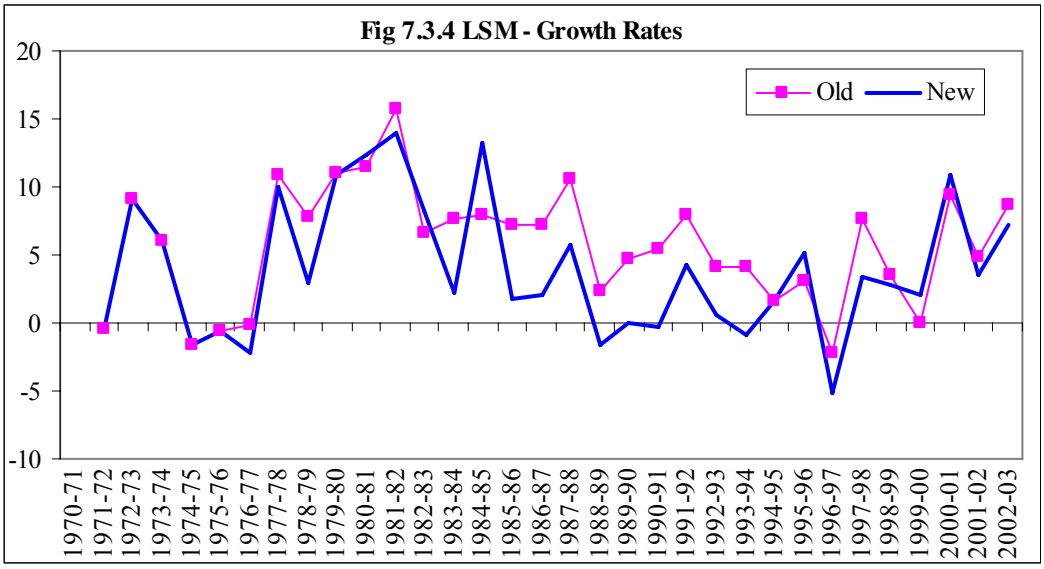
| Table 7.3.10 Mining & Quarrying: Provincial Growth Rates (%) | | | | | |
|---|---|---|---|---|---|
| | Punjab | Sindh | N.W.F.P. | Balochistan | Pakistan |
| 1970-75 | -1.1 | 2.7 | 2.9 | 3.6 | 1.3 |
| 1975-80 | 14.5 | -3.1 | 47.6 | 7.2 | 7.5 |
| 1980-85 | 7.5 | 42.3 | 18.0 | 4.8 | 12.4 |
| 1985-90 | 12.9 | 16.3 | 25.9 | 3.6 | 11.7 |
| 1990-95 | -1.3 | 6.2 | 5.0 | 1.1 | 2.4 |
| 1995-00 | 2.1 | 1.9 | 9.1 | 2.8 | 2.3 |
| 2000-05 | 1.2 | 11.1 | 26.5 | -1.7 | 6.2 |
| Overall | 5.3 | 11.3 | 19.8 | 3.1 | 6.4 |

### 7.3.2 Manufacturing

*i) Large-scale manufacturing*

| Table 7.3.11 LSM: Old and New Growth Rates - averages (%) | | |
|---|---|---|
| | Old Base (1980-81) | New Base (1999-00) |
| 1970-75 | 3.3 | 3.3 |
| 1975-80 | 5.8 | 4.2 |
| 1980-85 | 9.9 | 10.0 |
| 1985-90 | 6.4 | 1.6 |
| 1990-95 | 4.7 | 1.1 |
| 1995-00 | 2.4 | 1.6 |
| 2000-03 | 7.7 | 7.2 |
| Overall | 5.7 | 4.0 |

The estimates of gross value added of large-scale manufacturing as estimated by this study are the same for the period 1999-00 onward as those estimated by FBS because this study also uses the same information set as used by FBS (as already explained in section 4.2.2). However, comparing the growth rates of new series of large-scale manufacturing value added with the old one it comes out that new growth rates are lower than old growth rates throughout the period (Table 7.3.11). However, the pattern of movement across decades is the same, i.e. low-high-low-high during the decades of 1970s-1980s-1990s-2000s (Fig 7.3.4).




Our results show that manufacturing activities are the highest in the third quarter (about 27%) followed by the second quarter (Table 7.3.12). As we have applied the same seasonal factors on small-scale manufacturing, so this also shows seasonality of SSM.

**Table 7.3.12 LSM: Seasonal Factors** (1999-00 prices) %

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
|---|---|---|---|---|
| 1970-75 | 23.0 | 26.4 | 27.0 | 23.7 |
| 1975-80 | 23.0 | 26.3 | 27.0 | 23.7 |
| 1980-85 | 22.9 | 26.3 | 27.0 | 23.8 |
| 1985-90 | 23.5 | 26.3 | 26.9 | 23.3 |
| 1990-95 | 23.0 | 25.7 | 27.1 | 24.2 |
| 1995-00 | 22.7 | 25.8 | 27.1 | 24.4 |
| 2000-05 | 22.4 | 24.2 | 27.9 | 25.6 |
| Overall | 22.9 | 25.8 | 27.1 | 24.1 |

As shown in Table 7.3.13, the province of Sindh has the highest share in large-scale manufacturing value added (47 percent), followed by the Punjab (43 percent), NWFP (9 percent) and Balochistan (a meager 1%). In terms of growth rates, Balochistan has shown the highest growth (16.6 percent) during the period of 1970-2005 (Table 7.3.14), however, as the volume of large-scale manufacturing is very low in this province, such a high growth has no significance. The average growth in other three provinces was about 5 percent.

| **Table 7.3.13 LSM: Provincial shares** (1999-00 prices) % | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 43.8 | 47.7 | 8.2 | 0.3 |
| 1975-80 | 43.8 | 47.7 | 8.2 | 0.3 |
| 1980-85 | 40.7 | 48.7 | 9.6 | 1.0 |
| 1985-90 | 40.7 | 48.7 | 9.6 | 1.0 |
| 1990-95 | 43.2 | 45.3 | 9.5 | 2.1 |
| 1995-00 | 43.2 | 45.3 | 9.5 | 2.1 |
| 2000-05 | 43.2 | 45.3 | 9.5 | 2.1 |
| Overall | 42.7 | 46.9 | 9.1 | 1.3 |

| **Table 7.3.14 LSM: Provincial Growth Rates** (1999-00 prices) % | | | | | |
|---|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
| 1970-75 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| 1975-80 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| 1980-85 | 8.4 | 10.5 | 13.9 | 67.6 | 10.0 |
| 1985-90 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |
| 1990-95 | 2.3 | -0.3 | 0.9 | 24.1 | 1.1 |
| 1995-00 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |
| 2000-05 | 11.1 | 11.1 | 11.1 | 11.1 | 11.1 |
| Overall | 4.7 | 4.6 | 5.3 | 16.6 | 4.7 |

*ii) Small-scale manufacturing*

Since the present study adopts the same fixed growth rates as by FBS, there is no difference between the two estimates.

In case of small scale manufacturing, the Punjab has the highest share (68 percent), followed by Sindh (25 percent), NWFP (6 percent) and Balochistan (less than 1%) (Table 7.3.15). Over the years, the share of the Punjab increased while that of Sindh declined.

| **Table 7.3.15 SSM: Provincial shares (%)** | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 66.0 | 28.6 | 4.4 | 0.9 |
| 1975-80 | 66.0 | 28.6 | 4.4 | 0.9 |
| 1980-85 | 66.0 | 28.6 | 4.4 | 0.9 |
| 1985-90 | 68.7 | 24.9 | 5.4 | 1.1 |
| 1990-95 | 70.4 | 22.3 | 6.1 | 1.2 |
| 1995-00 | 70.5 | 19.6 | 9.1 | 0.8 |
| 2000-05 | 70.6 | 18.9 | 9.8 | 0.7 |
| Overall | 68.3 | 24.5 | 6.2 | 0.9 |

*iii) Slaughtering*

In case of gross value added of slaughtering, there are huge differences between the two estimates. As Table 7.3.16 shows the output value in the benchmark year is

almost the same in the two sets of estimates; the difference actually lies in inputs. One of the major inputs of slaughtering is "Net Sales" which is output of Livestock sector; as explained in detail in section 4.1.3 (Livestock section), FBS has overestimated Net sales. This overestimation has lead to their estimate of slaughtering underestimated. It is interesting to note that if we combine the gross value added of livestock and slaughtering then the difference between FBS and our estimates almost vanishes.

**Table 7.3.16 Slaughtering: Comparison of Estimates** (Rs million) (1999-00 prices)

| | Present study's estimates | | | | FBS estimates | | | |
|---|---|---|---|---|---|---|---|---|
| | Output | Input | GVA | Growth | Output | Input | GVA | Growth |
| 1999-00 | 200319 | 96409 | 103910 | | 203830 | 152003 | 51827 | |
| 2000-01 | 206635 | 98598 | 108037 | 3.97 | | | 53360 | 2.96 |
| 2001-02 | 212576 | 100598 | 111979 | 3.65 | | | 54985 | 3.05 |
| 2002-03 | 218705 | 102541 | 116164 | 3.74 | | | 56602 | 2.94 |
| 2002-04 | 224321 | 103546 | 120775 | 3.97 | | | 57966 | 2.41 |
| 2002-05 | 225295 | 103905 | 121390 | 0.51 | | | 59363 | 2.41 |

As it has already been mentioned in section 5.2.2, we have used seasonal factors as suggested in FBS study on slaughtering for all the years. Thus the seasonal factors of slaughtering are 0.18, 0.25, 0.35 and 0.22 for first, second, third and fourth quarters respectively.

Regarding provincial distribution of gross value added of slaughtering, it is found that the Punjab is the major share holder (45 percent) followed by Sindh (20 percent), Balochistan (18 percent) and NWFP (16%). However, the share of the Punjab has declined over time while that of Sindh and NWFP has increased (Table 7.3.17).

**Table 7.3.17 Slaughtering: Provincial Shares (%)**

| | Punjab | Sindh | NWFP | Balochistan |
|---|---|---|---|---|
| 1970-75 | 52.6 | 15.0 | 17.3 | 15.0 |
| 1975-80 | 50.3 | 18.3 | 13.2 | 18.2 |
| 1980-85 | 46.2 | 18.8 | 14.1 | 20.9 |
| 1985-90 | 43.8 | 19.8 | 15.3 | 21.1 |
| 1990-95 | 41.6 | 21.4 | 16.7 | 20.3 |
| 1995-00 | 41.1 | 23.3 | 18.8 | 16.9 |
| 2000-05 | 39.3 | 25.1 | 19.5 | 16.1 |
| Overall | 45.0 | 20.3 | 16.4 | 18.4 |

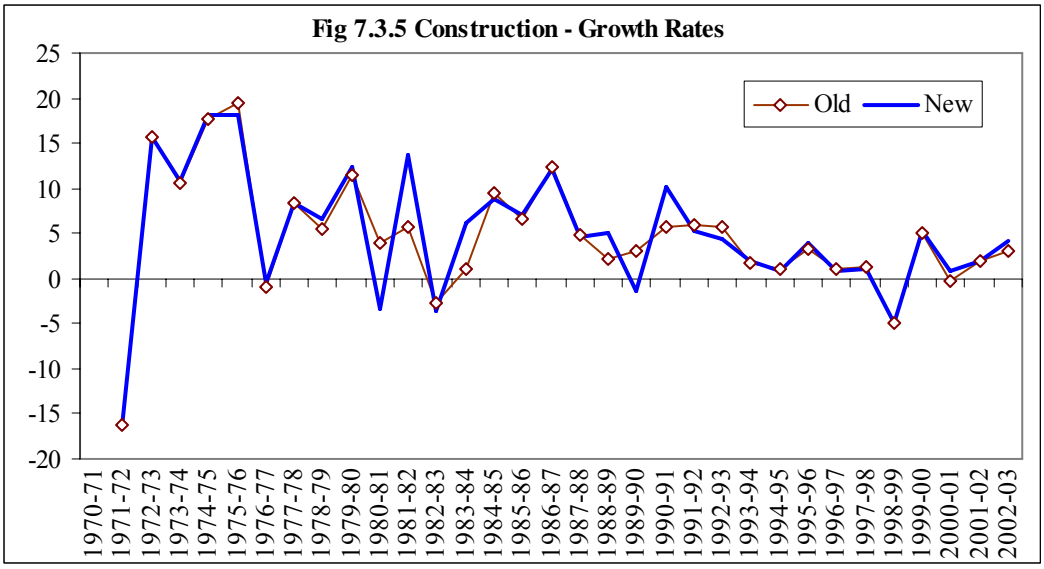
### 7.3.3 Construction

The estimates of gross value added of construction by FBS and this study are almost the same for the period 1999-00 onward, which gives confidence to the series estimated by this study for years prior to 1999-00 (Table 7.3.18).

**Table 7.3.18 Construction: Comparison of Estimates -** Rs million (1999-00 prices)

| | Present study's estimates | FBS estimates | % difference |
|---|---|---|---|
| 1999-00 | 87390 | 87386 | 0.0 |
| 2000-01 | 88031 | 87846 | 0.2 |
| 2001-02 | 89823 | 89241 | 0.7 |
| 2002-03 | 93473 | 92789 | 0.7 |
| 2003-04 | 82644 | 82818 | -0.2 |
| 2004-05 | 98983 | 98190 | 0.8 |

There is also a similar pattern in the movements of growth rates of our new base series and the old series (Fig 7.3.5)




Within a given year, construction activities increase in summer season and decline in winter season. The highest value addition in this sector takes place during the first quarter (26.4 percent) followed by third and fourth quarters (above 25 percent). The second quarter which is winter season witness lower construction activities with share in annual value added of 2.3 percent (Table 7.3.19).

| **Table 7.3.19 Construction: Seasonal Factors (%)** | | | | |
|---|---|---|---|---|
| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
| 1970-75 | 26.5 | 24.7 | 23.6 | 25.3 |
| 1975-80 | 26.6 | 21.4 | 25.9 | 26.1 |
| 1980-85 | 27.7 | 21.3 | 25.5 | 25.6 |
| 1985-90 | 26.6 | 22.2 | 25.3 | 25.9 |
| 1990-95 | 26.0 | 22.7 | 26.2 | 25.1 |
| 1995-00 | 26.0 | 26.2 | 25.7 | 22.2 |
| 2000-05 | 25.6 | 24.7 | 25.0 | 24.8 |
| Overall | 26.4 | 23.3 | 25.3 | 25.0 |

The provincial distribution of construction value added reveals that the share of the Punjab in construction value added is the highest (55 percent) followed by Sindh (24 percent), NWFP (12 percent) and Balochistan (8.5 percent).The shares of the Punjab and NWFP have declined over time and that of Sindh has increased significantly (Table 7.3.20).

| **Table 7.3.20 Construction: Provincial shares** (1999-00 prices) % | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 57.1 | 20.4 | 14.0 | 8.5 |
| 1975-80 | 55.8 | 22.1 | 13.6 | 8.6 |
| 1980-85 | 55.7 | 22.7 | 13.1 | 8.5 |
| 1985-90 | 55.2 | 24.5 | 12.4 | 7.9 |
| 1990-95 | 54.1 | 26.0 | 11.6 | 8.4 |
| 1995-00 | 53.9 | 26.5 | 11.1 | 8.5 |
| 2000-05 | 53.5 | 26.9 | 10.6 | 9.0 |
| Overall | 55.0 | 24.2 | 12.3 | 8.5 |

All the provinces have witnessed slow down in the growth rates of construction value added (Table 7.3.21) with the lowest growth rates in later part of 1990s. There was, however, some revival of growth in construction during 2000-05. The overall average growth rate was highest in Sindh (5.9 percent) followed by Balochistan (5 percent), the Punjab (4.7 percent) and NWFP (4 percent).

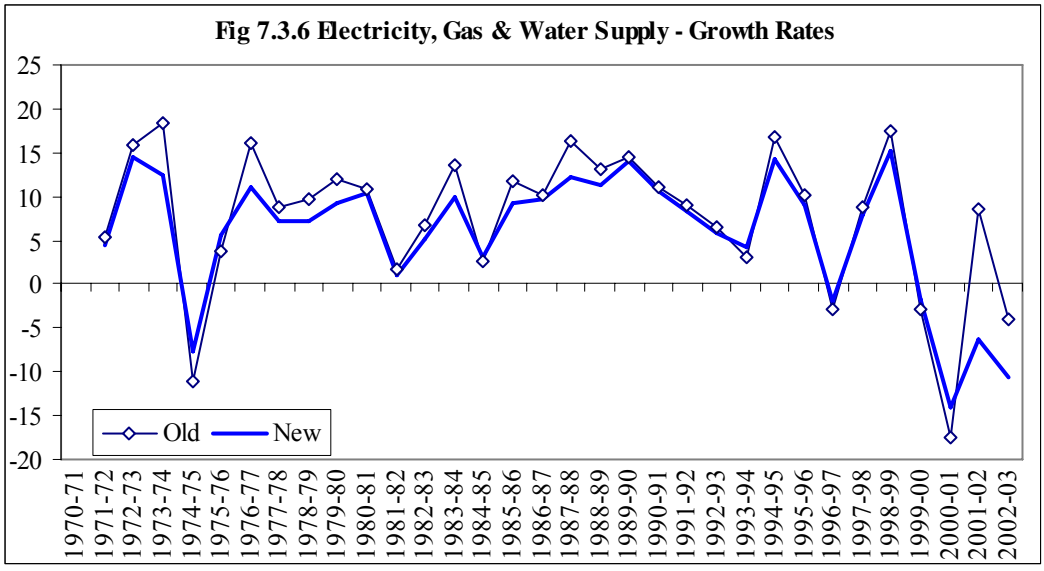
| **Table 7.3.21 construction: Provincial Growth Rates** (1999-00 prices) % | | | | | |
|---|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
| 1970-75 | 6.3 | 10.3 | 6.6 | 6.0 | 7.1 |
| 1975-80 | 8.7 | 10.1 | 8.1 | 10.0 | 9.0 |
| 1980-85 | 4.5 | 4.9 | 3.4 | 3.0 | 4.3 |
| 1985-90 | 4.8 | 7.7 | 4.2 | 5.6 | 5.4 |
| 1990-95 | 4.3 | 5.3 | 3.1 | 5.5 | 4.5 |
| 1995-00 | 1.5 | 1.0 | 0.6 | 1.2 | 1.2 |
| 2000-05 | 2.8 | 3.3 | 2.6 | 4.1 | 3.0 |
| Overall | 4.7 | 5.9 | 4.0 | 5.0 | 4.9 |

### 7.3.4 Electricity, gas & water supply

Gross value added of electricity, gas and water supply for years 1999-00 (benchmark) as estimated by this study and FBS are almost the same; however, there are some differences in other years (Table 7.3.22). The difference may be due to the fact that the present study either uses old growth rates and apply them on the benchmark value or uses some proxies; however, the extent of differences is not very large so past series as estimated by this study can safely be used. The new series very closely follows the path of the old series (Fig 7.3.6).

**Table 7.3.22 Electricity, Gas & Water Supply, Comparison of Results**
(Rs million) (1999-00 prices)

| | Present study's estimates | FBS estimates | % difference |
|---|---|---|---|
| 1999-00 | 139627 | 139,626 | 0.00 |
| 2000-01 | 119966 | 120,465 | -0.41 |
| 2001-02 | 112362 | 112,026 | 0.30 |
| 2002-03 | 100429 | 98,932 | 1.51 |
| 2003-04 | 156024 | 155,078 | 0.61 |
| 2004-05 | 161366 | 160,487 | 0.55 |




The seasonal patter of gross value added of this sector shows that it is the highest in the last quarter (Apr-Jun) with a share of more than 28 percent. In the third quarter, lowest 23.3 percent of the annual value added of this sector is generated.

| **Table 7.3.23 Electricity, Gas & Water Supply:** Seasonal Factors | | | | |
|---|---|---|---|---|
| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
| 1970-75 | 23.1 | 24.4 | 23.2 | 29.3 |
| 1975-80 | 23.4 | 24.4 | 23.2 | 29.0 |
| 1980-85 | 23.8 | 24.5 | 23.3 | 28.4 |
| 1985-90 | 24.3 | 24.5 | 23.2 | 28.0 |
| 1990-95 | 24.6 | 24.5 | 23.4 | 27.6 |
| 1995-00 | 24.7 | 24.5 | 23.3 | 27.4 |
| 2000-05 | 24.5 | 24.6 | 23.3 | 27.5 |
| Overall | 24.1 | 24.5 | 23.3 | 28.2 |

In gross value added of electricity, gas and water supply, the Punjab has the highest share (59 percent) followed by Sindh (29 percent), NWFP (9 percent) and Balochistan (3 percent). Over time the shares of both the Punjab and Sindh have declined (Table 7.3.24) while those of NWFP and Balochistan have increased.

| **Table 7.3.24 Electricity, Gas & Water Supply: Provincial shares** | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 61.8 | 29.0 | 7.6 | 1.5 |
| 1975-80 | 60.4 | 30.7 | 6.8 | 2.2 |
| 1980-85 | 60.1 | 30.0 | 7.1 | 2.7 |
| 1985-90 | 59.1 | 28.7 | 9.0 | 3.2 |
| 1990-95 | 57.6 | 29.0 | 9.9 | 3.5 |
| 1995-00 | 57.1 | 27.7 | 11.5 | 3.7 |
| 2000-05 | 58.6 | 25.8 | 10.4 | 5.2 |
| Overall | 59.2 | 28.7 | 8.9 | 3.1 |

The growth rates of gross value added of electricity, gas and water supply has declined over time in Sindh and NWFP (Table 7.3.25). The province of Balochistan, though have the lowest share in the sector has shown the highest growth rate followed by NWFP. The Punjab, on the other hand showed the lowest growth.

| **Table 7.3.25 Electricity, Gas & Water Supply: Provincial Growth Rates** | | | | | |
|---|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
| 1970-75 | 4.8 | 8.2 | 8.2 | 7.0 | 5.9 |
| 1975-80 | 8.0 | 8.2 | 6.7 | 16.5 | 8.1 |
| 1980-85 | 5.6 | 5.3 | 9.2 | 11.5 | 5.9 |
| 1985-90 | 10.8 | 10.9 | 16.2 | 13.9 | 11.3 |
| 1990-95 | 8.2 | 8.7 | 11.4 | 9.4 | 8.7 |
| 1995-00 | 5.8 | 4.7 | 6.6 | 8.0 | 5.7 |
| 2000-05 | 5.9 | 4.6 | 4.5 | 11.1 | 5.5 |
| Overall | 7.1 | 7.2 | 9.0 | 11.2 | 7.3 |

## 7.4 Services

The gross value added of services sector at 1999-00 prices estimated by this study for the year 1999-00 onward is fairly close to that estimated by FBS (Table 7.4.1) which gives confidence to the series of services gross value added for years prior to 1999-00 that is estimated by the current study and not available officially.

**Table 7.4.1 Services: Comparison of Estimates**
Rs million (1999-00 prices)

| | Present study's estimates | FBS estimates | % difference |
|---|---|---|---|
| 1999-00 | 1,793,612 | 1,807,546 | -0.8 |
| 2000-01 | 1,858,372 | 1,863,396 | -0.3 |
| 2001-02 | 1,948,168 | 1,952,146 | -0.2 |
| 2002-03 | 2,051,554 | 2,052,901 | -0.1 |
| 2003-04 | 2,179,528 | 2,173,947 | 0.3 |
| 2004-05 | 2,369,756 | 2,347,552 | 0.9 |

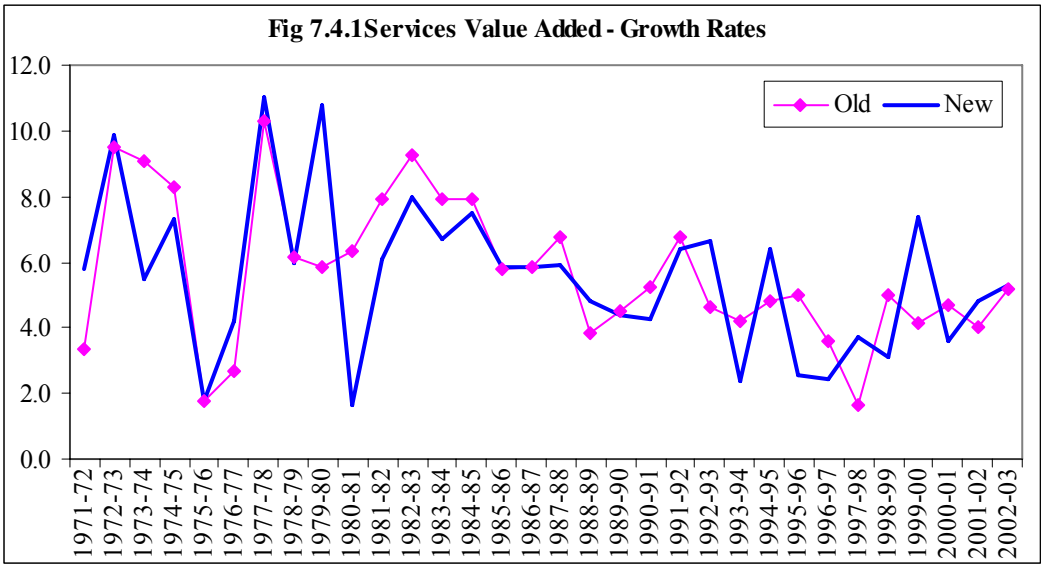
When compared with old series, it is found that growth rates of new series as estimated by this study have similar pattern on average as those of the old series at 1980-81 base (Table 7.4.2). However, year-to-year movements of the two series have dissimilarities in a number of years (Fig 7.4.1).

**Table 7.4.2 Services: Old and New Growth Rates - averages**

| | Old Base (1980-81) | New Base (1999-00) |
|---|---|---|
| 1970-75 | 7.5 | 7.1 |
| 1975-80 | 5.4 | 6.7 |
| 1980-85 | 7.9 | 6.0 |
| 1985-90 | 5.3 | 5.4 |
| 1990-95 | 5.1 | 5.2 |
| 1995-00 | 3.9 | 3.8 |
| 2000-05* | 4.6 | 5.7 |
| Overall | 5.7 | 5.7 |

* Growth of old base data is for 2000-03

**Fig 7.4.1Services Value Added - Growth Rates**

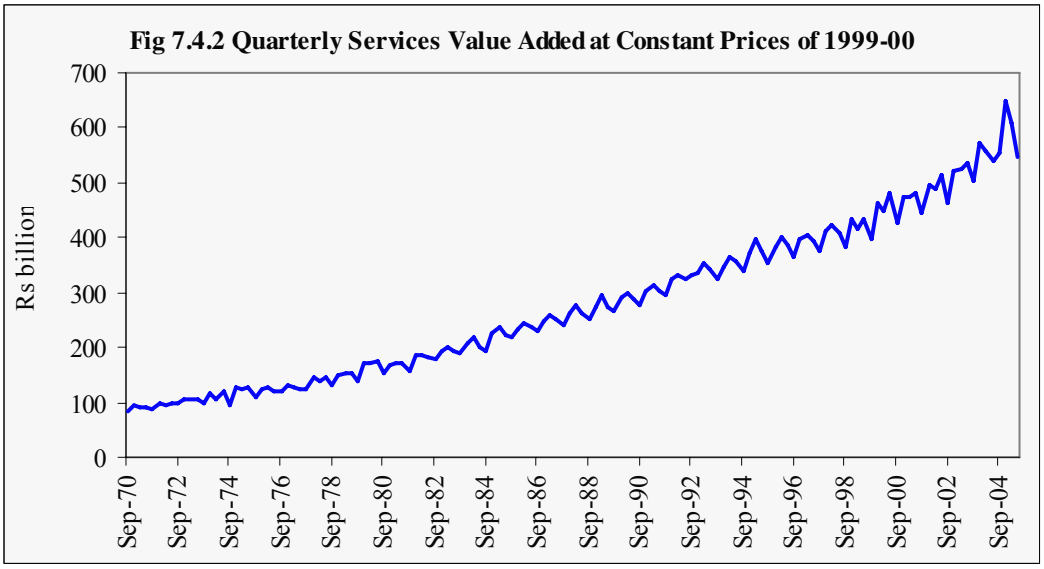



The movement of the gross value added in services within a year shows that services value added is spread almost evenly throughout the year except the first quarter

wherein it is very low at 23 percent. The other three quarters share almost equally in services (Table 7.4.3).

**Table 7.4.3 Real Value Added in Services - Seasonal Factors (%)**
(1999-00 prices)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
|---|---|---|---|---|
| 1970-75 | 22.5 | 26.2 | 25.2 | 26.1 |
| 1975-80 | 22.5 | 26.0 | 25.7 | 25.7 |
| 1980-85 | 22.7 | 25.6 | 26.3 | 25.4 |
| 1985-90 | 23.2 | 25.2 | 26.4 | 25.2 |
| 1990-95 | 23.4 | 25.1 | 26.2 | 25.3 |
| 1995-00 | 22.9 | 25.6 | 25.7 | 25.8 |
| 2000-05 | 23.0 | 26.1 | 25.6 | 25.3 |
| Overall | 22.9 | 25.7 | 25.9 | 25.6 |




The provincial distribution of services value added shows that the Punjab contributes 49.2 percent of the gross value added in this sector followed by Sindh by 32.7 percent, NWFP by 12.6 percent and Balochistan by 5.4 percent (Table 7.4.4). The results of this study are slightly different to those of Bengali and Sadaqat (2005) who find the Punjab's share as 52 percent average during the period 1972-00 and Balochistan's share as 3.9 percent average during this period (Table 7.4.5); compared with average share of 49.6 percent and 5.5 percent for the Punjab and Balochistan respectively during the same period estimated by the present study. The results for Sindh and NWFP are similar in both the studies.

| Table 7.4.4 Real Value Added in Services - Share of Provinces (%) (1999-00 prices) | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 50.2 | 33.3 | 12.1 | 4.4 |
| 1975-80 | 49.2 | 33.9 | 12.0 | 5.0 |
| 1980-85 | 48.1 | 33.8 | 12.5 | 5.5 |
| 1985-90 | 48.2 | 33.0 | 12.8 | 6.0 |
| 1990-95 | 48.8 | 32.0 | 12.9 | 6.3 |
| 1995-00 | 49.9 | 30.9 | 13.2 | 6.0 |
| 2000-05 | 50.2 | 31.8 | 12.9 | 5.1 |
| Overall | 49.2 | 32.7 | 12.6 | 5.5 |

| Table 7.4.5 Real Services: Bengali and Sadaqat Provincial Shares (%) (1980-81 prices) | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1972-75 | 49.6 | 33.3 | 12.3 | 4.7 |
| 1975-80 | 50.6 | 32.7 | 12.3 | 4.4 |
| 1980-85 | 51.5 | 32.3 | 12.1 | 4.1 |
| 1985-90 | 52.2 | 32.4 | 11.8 | 3.6 |
| 1990-95 | 52.7 | 31.7 | 12.0 | 3.6 |
| 1995-00 | 54.4 | 29.9 | 12.3 | 3.4 |
| Overall | 52.0 | 32.0 | 12.1 | 3.9 |

In terms of growth rates, Balochistan and NWFP had shown higher average growth during the last 35 years compared with the Punjab and Sindh (Table 7.4.6); however, both Balochistan and NWFP are too far to catch up the other two provinces of the Punjab and Sindh.

| Table 7.4.6 Real Growth in Services Value Added by Provinces (%) (1999-00 prices) | | | | | |
|---|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
| 1970-75 | 7.3 | 7.1 | 4.8 | 11.7 | 7.1 |
| 1975-80 | 5.9 | 7.6 | 8.2 | 6.9 | 6.7 |
| 1980-85 | 5.8 | 5.7 | 5.9 | 9.9 | 6.0 |
| 1985-90 | 5.5 | 4.3 | 7.0 | 6.9 | 5.4 |
| 1990-95 | 5.6 | 4.9 | 4.4 | 5.6 | 5.2 |
| 1995-00 | 4.5 | 3.1 | 4.1 | 1.4 | 3.8 |
| 2000-05 | 5.3 | 6.9 | 6.1 | 2.1 | 5.7 |
| Overall | 5.7 | 5.6 | 5.8 | 6.2 | 5.7 |

### 7.4.1 Trade, hotels & restaurants

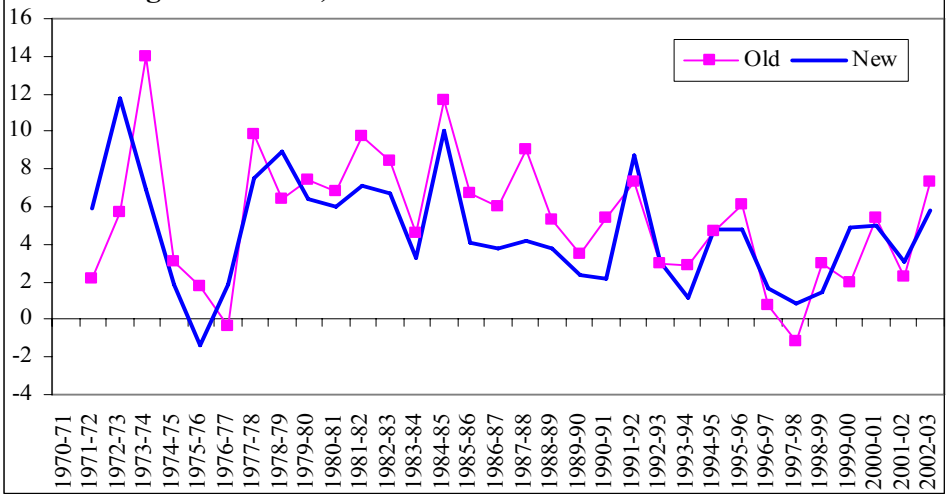
The difference between the gross value added of trade, hotels and restaurants as estimated by this study and that by FBS ranged between -2.3 to 0.8 percent for the years 1999-00 onward (Table 7.4.7). It is primarily due to differences in the two estimates of livestock and use of proxies for hotels and restaurants. However, it is

argued that the difference is too small to affect the trend of gross value added in overall services sector or GDP.

**Table 7.4.7 Trade, Hotels & Restaurants: Comparison of Estimates**
(Rs million) (1999-00 prices)

| | Present study's estimates | FBS estimates | % difference |
|---|---|---|---|
| 1999-00 | 607,773 | 621,842 | -2.3 |
| 2000-01 | 638,315 | 649,564 | -1.7 |
| 2001-02 | 657,797 | 667,615 | -1.5 |
| 2002-03 | 696,268 | 707,145 | -1.5 |
| 2003-04 | 760,941 | 766,693 | -0.8 |
| 2004-05 | 858,886 | 851,744 | 0.8 |

**Fig 7.4.3 Trade, Hotels & Restaurants - Growth Rates**




The growth rates of the new series of value added of this sector follows the similar path as of the series at old base of 1980-81; however, the new series show lesser oscillation (with variance 8.5) as compared with old one (with variance 11.7) (Fig 7.4.3).

The results of quarterisation show that the value added of trade and hotel activities is highest in third and fourth quarters and lowest in the first quarter (Table 7.4.8).

**Table 7.4.8 Trade, Hotels & Restaurants: Seasonal Factors**

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
|---|---|---|---|---|
| 1970-75 | 21.9 | 25.5 | 26.7 | 25.9 |
| 1975-80 | 21.4 | 25.3 | 27.0 | 26.3 |
| 1980-85 | 21.6 | 25.6 | 26.8 | 26.1 |
| 1985-90 | 21.5 | 26.0 | 26.9 | 25.7 |
| 1990-95 | 21.4 | 26.0 | 27.1 | 25.5 |
| 1995-00 | 21.0 | 26.4 | 26.8 | 25.8 |
| 2000-05 | 21.0 | 25.2 | 27.3 | 26.4 |
| Overall | 21.4 | 25.7 | 27.0 | 26.0 |

The provincial distribution, on the other hand, shows that the province of the Punjab holds 50 percent of the total gross value added in trade, hotels and restaurants (Table 7.4.9) followed by Sindh (33 percent), NWFP (11 percent) and Balochistan (5.7 percent). The growth rate of this sector has remained stable in Sindh and the Punjab while the other two provinces, particularly Balochistan showed larger variations in growth (Table 7.4.10).

**Table 7.4.9 Trade, Hotels & Restaurants: Provincial Shares** (1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan |
|---|---|---|---|---|
| 1970-75 | 52.5 | 31.7 | 11.5 | 4.3 |
| 1975-80 | 51.5 | 32.9 | 10.2 | 5.4 |
| 1980-85 | 48.6 | 34.6 | 10.9 | 5.8 |
| 1985-90 | 49.2 | 33.9 | 11.0 | 5.8 |
| 1990-95 | 50.1 | 32.2 | 10.9 | 6.8 |
| 1995-00 | 50.0 | 32.5 | 11.2 | 6.3 |
| 2000-05 | 50.6 | 32.0 | 12.2 | 5.3 |
| Overall | 50.4 | 32.8 | 11.1 | 5.7 |

**Table 7.4.10 Trade, Hotels & Restaurants: Provincial Growth Rates** (1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-75 | 9.1 | 9.6 | 5.0 | 11.1 | 8.8 |
| 1975-80 | 2.9 | 4.2 | 0.7 | 9.7 | 3.4 |
| 1980-85 | 5.9 | 8.0 | 8.7 | 8.6 | 7.0 |
| 1985-90 | 5.3 | 4.7 | 5.4 | 4.8 | 5.1 |
| 1990-95 | 4.4 | 3.0 | 3.8 | 7.2 | 4.0 |
| 1995-00 | 2.4 | 3.0 | 3.3 | 1.9 | 2.6 |
| 2000-05 | 4.4 | 3.3 | 6.7 | 0.4 | 4.0 |
| Overall | 4.5 | 4.7 | 4.8 | 5.8 | 4.6 |

### 7.4.2 Transport, storage & communication

In case of transport, storage and communication also, the estimates of this study are fairly close to those by FBS (Table 7.4.11) reflecting the aptness in estimation technique adopted by this study.

**Table 7.4.11 Transport, Storage & Communication: Comparison of Estimates -** Rs million (1999-00 prices)

| | Present study's estimates | FBS estimates | % difference |
|---|---|---|---|
| 1999-00 | 400,981 | 400,983 | 0.0 |
| 2000-01 | 423,227 | 422,195 | 0.2 |
| 2001-02 | 430,501 | 427,296 | 0.7 |
| 2002-03 | 449,236 | 445,552 | 0.8 |
| 2003-04 | 464,191 | 461,276 | 0.6 |
| 2004-05 | 482,574 | 477,701 | 1.0 |

Comparing the growth rates of new estimates with old growth rates, Fig 7.4.4 shows that new growth rates are generally higher than old growth rates and there is also difference in the pattern of movements. It may be due to expansion in the sector in new methodology, e.g. courier services and mobile phones was not included in old methodology but now they have been included and have 4 to 5 percent share in the gross value added of this sector.

**Fig 7.4.4 Transport, Storage & Communication - Growth Rates**

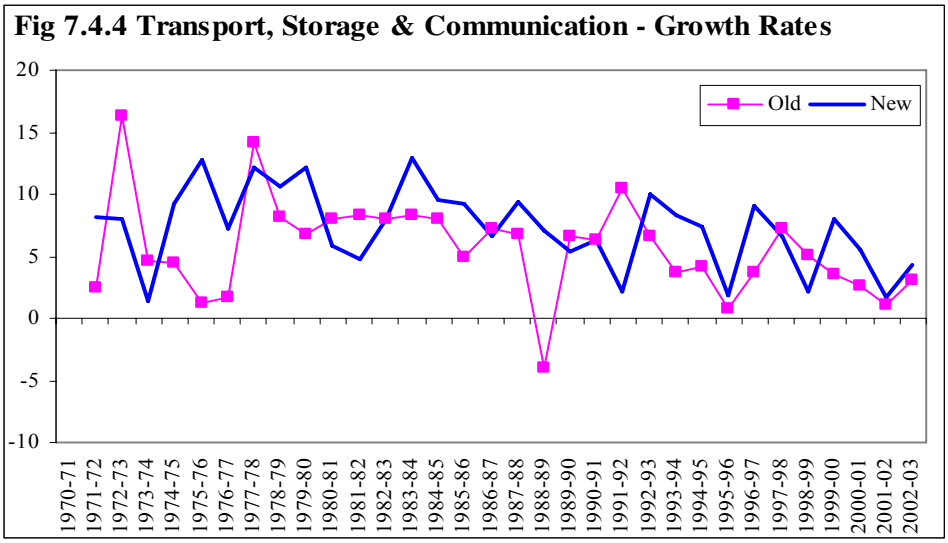



Table 7.4.12 reports the seasonal factors as computed though quarterisation of annual gross value added of this sector: the results show that gross value added is higher in the last two quarters as compared to the first two quarters. However, there are not strong seasonal variations in this sector. In fact, there is a gradual increase in the gross value added of this sector during the year.

**Table 7.4.12 Transport, Storage & Communication: Seasonal Factors**
(1999-00 prices)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
|---|---|---|---|---|
| 1970-75 | 24.4 | 24.7 | 25.2 | 25.7 |
| 1975-80 | 24.1 | 24.7 | 25.3 | 25.9 |
| 1980-85 | 24.3 | 24.7 | 25.2 | 25.8 |
| 1985-90 | 24.3 | 24.8 | 25.2 | 25.7 |
| 1990-95 | 24.4 | 24.8 | 25.2 | 25.6 |
| 1995-00 | 24.5 | 24.8 | 25.2 | 25.6 |
| 2000-05 | 25.5 | 26.6 | 25.5 | 22.3 |
| Overall | 24.5 | 25.0 | 25.3 | 25.2 |

Like most of the other economic sectors, the province of the Punjab has the highest share in trade, hotels and restaurant (45 percent) followed by Sindh (34 percent).

While the shares of all other provinces increased over time, the share of Sindh declined from 39 percent in 1970s to 30 percent in recent years (Table 7.4.13).

**Table 7.4.13 Transport, Storage & Communication: Provincial Shares** (1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan |
|---|---|---|---|---|
| 1970-75 | 44.7 | 37.9 | 12.5 | 4.8 |
| 1975-80 | 42.0 | 39.1 | 13.4 | 5.5 |
| 1980-85 | 42.2 | 34.3 | 16.6 | 7.0 |
| 1985-90 | 43.6 | 32.9 | 15.4 | 8.1 |
| 1990-95 | 46.1 | 31.3 | 14.8 | 7.8 |
| 1995-00 | 47.1 | 30.0 | 15.5 | 7.4 |
| 2000-05 | 48.7 | 29.7 | 14.7 | 6.9 |
| Overall | 44.9 | 33.6 | 14.7 | 6.8 |

All the provinces have shown very high growth rates in gross value added of transport, storage and communication (Table 7.4.14). However, NWFP and Balochistan have witnessed sluggishness in NWFP and Balochistan during early years of 2000s, though on average their growth rates remained higher than 7 percent during the period of 1970-2005.

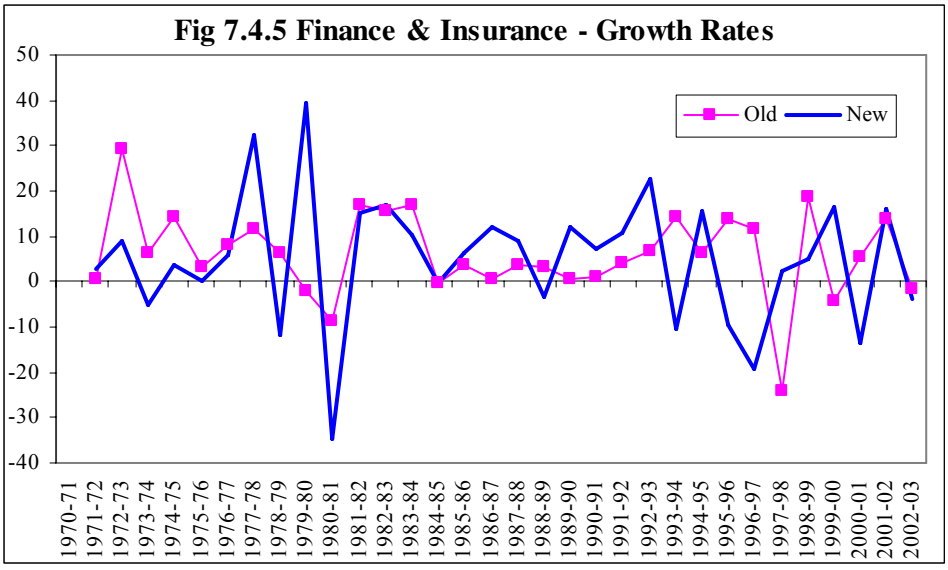
**Table 7.4.14 Transport, Storage & Communication: Provincial Growth Rates** (1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-75 | 6.6 | 7.3 | 3.2 | 11.5 | 6.7 |
| 1975-80 | 10.3 | 10.2 | 15.9 | 11.7 | 11.0 |
| 1980-85 | 7.7 | 6.7 | 10.4 | 15.7 | 8.2 |
| 1985-90 | 8.7 | 6.3 | 6.1 | 9.8 | 7.6 |
| 1990-95 | 8.4 | 5.9 | 5.5 | 4.5 | 6.8 |
| 1995-00 | 5.8 | 4.1 | 7.8 | 5.3 | 5.5 |
| 2000-05 | 4.0 | 5.2 | 1.7 | 1.6 | 3.8 |
| Overall | 7.4 | 6.5 | 7.4 | 8.5 | 7.1 |

### 7.4.3 Finance & Insurance

The gross value added of finance and insurance for benchmark year 1999-00 is the same in two estimates: one by this study and the other by FBS. However, there is a difference of more than 1 percent between the two estimates for some of the subsequent years (Table 7.4.15). This difference may be statistical discrepancy coming from changes in reporting format of financial information in Banking Statistics of Pakistan after 1999-00

| **Table 7.4.15 Finance & Insurance -** Rs million (1999-00 prices) | | | |
|---|---|---|---|
| | Present study's estimates | FBS estimates | % difference |
| 1999-00 | 132453 | 132,454 | 0.0 |
| 2000-01 | 114455 | 112,455 | 1.7 |
| 2001-02 | 132761 | 131,761 | 0.8 |
| 2002-03 | 127604 | 130,081 | -1.9 |
| 2003-04 | 140766 | 141,768 | -0.7 |
| 2004-05 | 181899 | 183,900 | -1.1 |




A comparison of growth rates of old based series and new series is given in Fig 7.4.5 which shows that two series of growth rates are different than each other. These differences can be explained by expansion in the coverage of financial institutions in the new estimates

The results of quarterisation show a strong seasonality in finance and insurance; financial activities are lowest in the first quarter and highest in the second quarter (more than 30% of the annual value added) (Table 7.4.16), which may be a reflection of seasonality of commodity producing sectors.

| **Table 7.4.16 Finance & Insurance: Seasonal Factors** (1999-00 prices) | | | | |
|---|---|---|---|---|
| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun |
| 1970-75 | 15.5 | 36.8 | 17.4 | 30.3 |
| 1975-80 | 18.0 | 36.5 | 22.2 | 23.3 |
| 1980-85 | 17.2 | 32.0 | 30.5 | 20.3 |
| 1985-90 | 24.2 | 24.3 | 30.9 | 20.6 |
| 1990-95 | 25.0 | 23.4 | 28.5 | 23.1 |
| 1995-00 | 20.3 | 29.0 | 23.7 | 27.0 |
| 2000-05 | 15.8 | 33.2 | 17.6 | 33.5 |
| Overall | 19.4 | 30.7 | 24.4 | 25.5 |

The province of Sindh dominates in finance and insurance services with a share of 63.6 percent; it is followed by the Punjab with a share of 29 percent, NWFP with a share of 6.5 percent and Balochistan with a share of less than 1 percent (Table 7.4.17).

**Table 7.4.17 Finance & Insurance: Provincial Shares** (1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan |
|---|---|---|---|---|
| 1970-75 | 31.2 | 58.9 | 8.9 | 1.1 |
| 1975-80 | 31.2 | 58.9 | 8.9 | 1.1 |
| 1980-85 | 25.7 | 67.6 | 5.7 | 1.0 |
| 1985-90 | 26.4 | 65.9 | 6.8 | 0.9 |
| 1990-95 | 29.9 | 64.6 | 5.0 | 0.5 |
| 1995-00 | 29.9 | 64.6 | 5.0 | 0.5 |
| 2000-05 | 29.7 | 64.8 | 5.0 | 0.5 |
| Overall | 29.1 | 63.6 | 6.5 | 0.8 |

The average growth rates in the Punjab and Sindh have been 6 percent while those in NWFP and Balochistan have been 5 percent and 4 percent respectively (Table 7.4.18). All the provinces witnessed a negative growth in the second half of 1990s, so the country as a whole.

**Table 7.4.18 Finance & Insurance: Provincial Growth Rates**

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-75 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| 1975-80 | 13.2 | 13.2 | 13.2 | 13.2 | 13.2 |
| 1980-85 | -0.9 | 3.4 | -3.2 | 0.3 | 1.4 |
| 1985-90 | 10.9 | 6.3 | 6.0 | -4.2 | 7.3 |
| 1990-95 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| 1995-00 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| 2000-05 | 6.7 | 8.0 | 8.1 | 8.1 | 7.6 |
| Overall | 5.9 | 6.0 | 5.0 | 4.0 | 5.8 |

### 7.4.4 Ownership of dwelling

The estimates of gross value added of ownership of dwelling by this study are very different to those estimated by the FBS for years after benchmark year of 1999-00 (Table 7.4.19). The benchmark estimates are the same simply because this study has adopted FBS estimates; the issue is really for other years. The present study estimates growth rates of dwelling significantly higher than those adopted by the FBS. The FBS has used a fixed growth rate of 3.5 percent while this study estimates the growth rate which is higher than 5 percent on the basis of quality adjusted housing growth in the country (detail of methodology used by this study is given in sections 4.3.4 and 6.3.4).

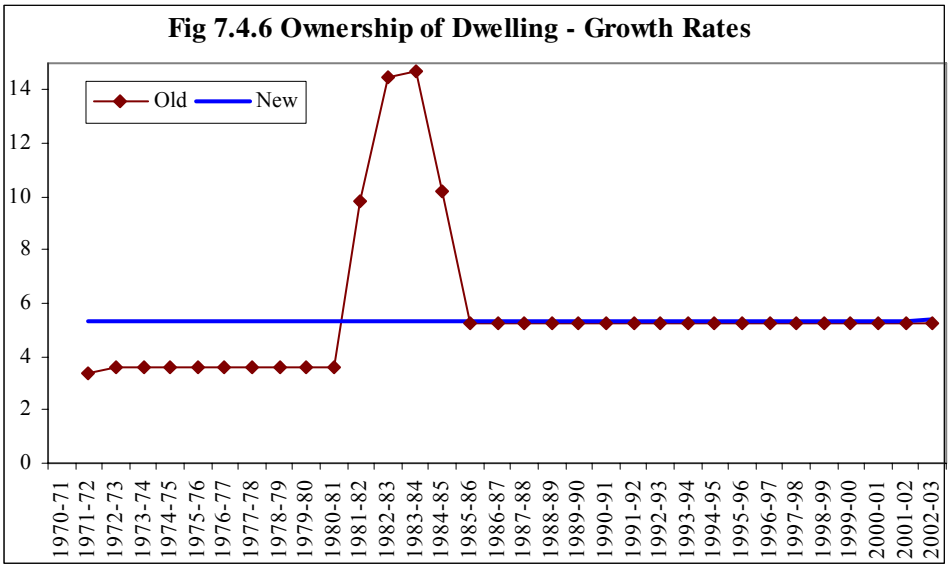
| **Table 7.4.19 Ownership of Dwelling: Comparison of Estimates**<br>Rs million (1999-00 prices) | | | |
|---|---|---|---|
| | Present study's estimates | FBS estimates | % difference |
| 1999-00 | 110425 | 110,425 | 0.0 |
| 2000-01 | 116341 | 114,593 | 1.5 |
| 2001-02 | 122577 | 118,604 | 3.3 |
| 2002-03 | 129150 | 122,466 | 5.5 |
| 2003-04 | 136078 | 126,764 | 7.3 |
| 2004-05 | 143381 | 131,214 | 9.3 |

The old series of gross value added of ownership of dwelling showed exceptionally high growth rates for years 1981-82 to 1984-85 that was due to methodological problems instead of actual developments. The growth rates estimated by this study are rather smoother over the years (Fig 7.4.6).

Like transport, storage and communication, the gross value added of ownership of dwelling also increased gradually over the four quarters in a year.

The highest contributor in gross value added of ownership of dwelling is the province of the Punjab with an average share of 58.4 percent; it is followed by Sindh with a share of 28.4 percent, NWFP with a share of 8.7 percent and Balochistan with a share of 4.5 percent (Table 7.4.20). Over the years, the shares of the Punjab and Balochistan have declined and those of NWFP and Sindh have increased.

**Fig 7.4.6 Ownership of Dwelling - Growth Rates**



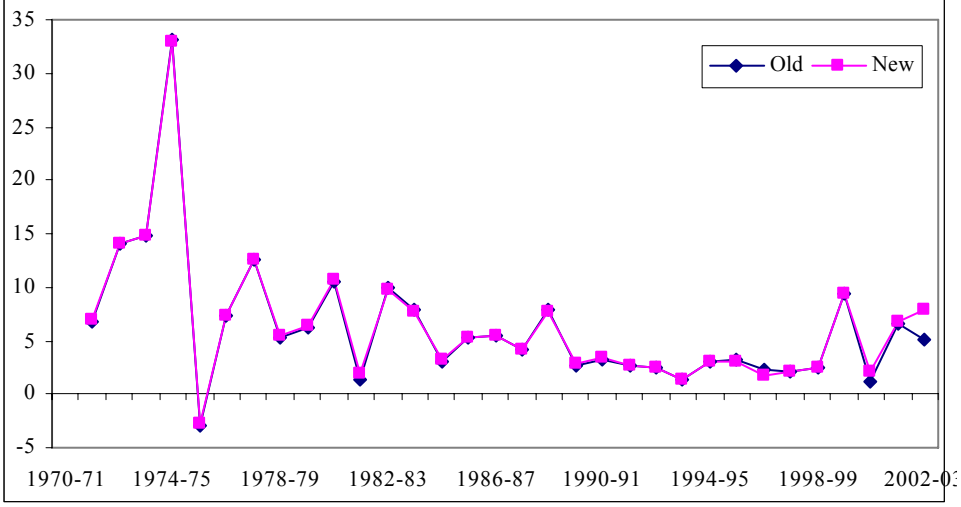
| **Table 7.4.20 Ownership of Dwelling: Provincial Shares** (1999-00 prices) | | | | |
|---|---|---|---|---|
| | Punjab | Sindh | NWFP | Balochistan |
| 1970-75 | 59.6 | 27.9 | 7.2 | 5.3 |
| 1975-80 | 59.3 | 28.1 | 7.6 | 5.0 |
| 1980-85 | 58.9 | 28.2 | 8.1 | 4.8 |
| 1985-90 | 58.5 | 28.4 | 8.6 | 4.5 |
| 1990-95 | 58.0 | 28.5 | 9.2 | 4.3 |
| 1995-00 | 57.5 | 28.6 | 9.8 | 4.1 |
| 2000-05 | 57.0 | 28.7 | 10.4 | 3.8 |
| Overall | 58.4 | 28.4 | 8.7 | 4.5 |

### 7.4.5 Public administration & defence

In the case of public administration and defence also, the estimates of gross value added by this study are the almost same as those by FBS (Table 7.4.21). The growth rates of new series also follow the same path and show the same pattern as old growth rates (Fig 7.4.7).

| **Table 7.4.21 Public Administration & Defence: Comparison of Estimates** Rs million (1999-00 prices) | | | |
|---|---|---|---|
| | Present study's estimates | FBS estimates | % difference |
| 1999-00 | 220429 | 220,291 | 0.1 |
| 2000-01 | 225207 | 225,152 | 0.0 |
| 2001-02 | 240386 | 240,585 | -0.1 |
| 2002-03 | 259359 | 259,148 | 0.1 |
| 2003-04 | 267427 | 267,321 | 0.0 |
| 2004-05 | 268849 | 268,826 | 0.0 |

**Fig 7.4.7 Public Administration & Defence - Growth Rates**




Regarding seasonal movements of gross value added of this sector, it has been mentioned in the section 4.3.5 the seasonal factors used for this sector are 0.2441, 0.2441, 0.2559, and 0.2559 for respective quarters.

According to the provincial distribution of gross value added of this sector, the share of the Punjab in the gross value added of public administration and defence is 54.2 percent which is followed by Sindh with a share of 25.1 percent, NWFP with a share of 14.5 percent and Balochistan with a share of 6.3 percent (Table 7.4.22).

**Table 7.4.22 Public Administration & Defence: Provincial Shares**
(1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan |
|---|---|---|---|---|
| 1970-75 | 55.5 | 23.9 | 13.7 | 6.9 |
| 1975-80 | 54.7 | 23.9 | 15.0 | 6.4 |
| 1980-85 | 55.5 | 24.1 | 14.6 | 5.8 |
| 1985-90 | 53.5 | 25.0 | 14.6 | 6.9 |
| 1990-95 | 53.6 | 25.0 | 14.4 | 7.0 |
| 1995-00 | 56.6 | 23.6 | 14.0 | 5.8 |
| 2000-05 | 49.8 | 30.0 | 14.9 | 5.3 |
| Overall | 54.2 | 25.1 | 14.5 | 6.3 |

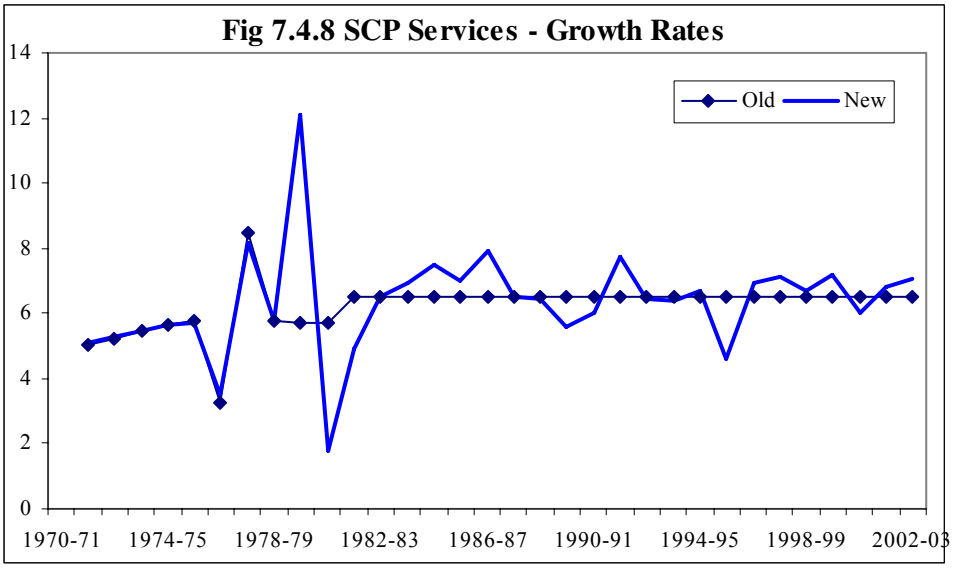
### 7.4.6 Social, community and private services

In the case of social, community and private services also, the gross value added of social, community and private services estimated by the present study are very close to FBS estimates (Table 7.4.23). However, the growth rates of new series are very different to the growth rates of the old series at 1980-81 base (Fig 7.4.8).

**Table 7.4.23 SCP Services: Comparison of Estimates**
Rs million (1999-00 prices)

| | Present study's estimates | FBS estimates | % difference |
|---|---|---|---|
| 1999-00 | 321551 | 321,551 | 0.0 |
| 2000-01 | 340826 | 339,437 | 0.4 |
| 2001-02 | 364147 | 366,285 | -0.6 |
| 2002-03 | 389937 | 388,509 | 0.4 |
| 2003-04 | 410125 | 410,125 | 0.0 |
| 2004-05 | 434167 | 434,167 | 0.0 |

The new data show more fluctuations over the years as compared to the old data. It may be due to the fact in old methodology most of the time fixed growth rates were assumed, while the new series has been estimated on the basis of different assumptions as already discussed earlier.




Regarding within the year movements, like transport, storage and communication, and ownership of dwelling, the gross value added of this sector also increase gradually over the four quarters in a year due to very nature of technique of quarterisation.

In the gross value added of social, community and private services also the Punjab is the biggest contributor with a share of 53.7 percent; it is followed by Sindh with a share of 23.7 percent, NWFP with a share of 17.1 percent and Balochistan with a share of 5.6 percent (Table 7.4.24).

**Table 7.4.24 SCP Services: Provincial Share** (1999-00 prices)

| | Punjab | Sindh | NWFP | Balochistan |
|---|---|---|---|---|
| 1970-75 | 51.9 | 27.4 | 16.4 | 4.3 |
| 1975-80 | 51.9 | 27.4 | 16.4 | 4.3 |
| 1980-85 | 53.8 | 24.8 | 15.9 | 5.4 |
| 1985-90 | 54.4 | 21.7 | 17.3 | 6.5 |
| 1990-95 | 53.4 | 19.6 | 19.9 | 7.1 |
| 1995-00 | 54.0 | 20.5 | 18.9 | 6.6 |
| 2000-05 | 56.6 | 24.3 | 14.6 | 4.5 |
| Overall | 53.7 | 23.7 | 17.1 | 5.6 |

# 8 Factorization of GDP: Capital Stock & Labour Inputs

This chapter and the one given next undertake factorization of the new series of gross domestic product and its sub-sectors under growth accounting framework and attempt to estimate the contributions of capital, labour and total factor productivity to output growth. This chapter presents a methodology to estimate capital stock valued at constant prices of 1999-00 and skill-adjusted labour. The next chapter 9 offers growth accounting framework and estimates total factor productivity.

Following the tradition set by Solow (1957), the framework for factorization of output starts with a production function with a Hick's neutral shift parameter and constant return to scale, i.e.,

$$Y_t = A_t F(K_t, L_t) \qquad (8.1)$$

$Y_t$ is output, $K_t$ is physical capital stock, and $L_t$ is used to denote a skill-adjusted measure of the labour input, such that $L = H \cdot N$ ; $H$ is an index of labour quality and $N$ is the number of persons in employed labour force. The Hicksian $A_t$ parameter measures the shift in the production function at given levels of labour and capital; it has also been termed in literature as Solow Residual, parameter of technical change and a measure of total factor productivity (TFP).

Whatever, the technique of factorization is used, one needs the values of all the variables *less* one. Since $A_t$ is estimated usually as residual, some estimates of the values of $Y_t$, $K_t$, and $L_t$ are necessary. While $Y_t$ at new base prices has already been estimated by this study; techniques to estimate $K_t$, and $L_t$ are given below.

### 8.1 Physical Capital

The capital stock has been estimated through perpetual inventory method (PIM) as follows.

$$K_t = I_{t-1} + (1-\delta)K_{t-1} \qquad (8.2)$$

$K_t$ is capital stock at the begining of the year $t$, $I_t$ is gross fixed capital formation and $\delta$ is depreciation.[69] PIM requires three types of information; a series of gross fixed capital formation at constant prices of 1999-00, initial capital stock (for the year 1970-71 in our case) and the rate of depreciation. The series of gross fixed capital formation at current prices is available since 1963-64 at sectoral level (FBS, 1998, 50 Years of Pakistan in Statistics).[70] In order to convert the series at constant prices of 1999-00, some deflator for each sector has been developed (i.e. separate deflator for gorss fixed capital formation in agriculture, manfacturing, trade, etc.), as defined below.

$$P_{jt} = \alpha_j PB_t + (1-\alpha_j)PM_t \qquad (8.3)$$

$P_{jt}$ is deflator for a sector $j$ (1999-00 = 100)

$PB_t$ is wholesale price index of building material group (1999-00 = 100)

$PM_t$ is wholesale price index of machinery group (1999-00 = 100)

$\alpha_j$ is the weight of building material in the deflator of the sector $j$. For a value of the weight $\alpha_j$, we have taken the relative share of structures in gross fixed capital formation in sector $j$; these shares have been taken from a study "Capital Formation in Pakistan 1999-00" undertaken by Arshad Zaman Associate for FBS and are given in the following table.

**Table 8.1 Distribution of Gross Fixed Capital Formation in 1999-00**

| Sectors | Structures | Equipment |
|---|---|---|
| Agriculture | 0.244 | 0.756 |
| Mining & Quarrying | 0.406 | 0.594 |
| Manufacturing | 0.285 | 0.715 |
| Construction | 0.933 | 0.067 |
| Electricity, Gas & Water Supply | 0.654 | 0.346 |
| Transport, Storage & Communication | 0.598 | 0.402 |
| Trade, Hotel & Restaurants | 0.375 | 0.625 |
| Finance & Insurance | 0.134 | 0.866 |
| Ownership of Dwellings* | 0.933 | 0.067 |
| Public Admin & Defence | 0.939 | 0.061 |
| Other Services | 0.400 | 0.600 |

* Assumed same as for construction

[69] If $K_t$ is defined as capital stock at the end of the year then equation (8.1) becomes $K_t = I_t + (1-\delta)K_{t-1}$, however, we prefer to define $K_t$ as beginning of the year as it is the capital stock which is used as input in the production process (the underlying assumption is, a unit of capital enters into production process with a lag of about one year).

[70] The gross fixed capital formation at constant prices of 1980-81 is also available since 1980-81, but we did not need to use it.

The next is the issue of initial capital stock. Starting with the equation (8.2), we can derive an expression for the initial capital (see Annexure C) which is:

$$K_{j0} = \frac{I_{j0}}{g_j + \delta_j} \tag{8.4}$$

$g$ is steady state growth rate of gross fixed capital formation during years prior to year 1 and $\delta$ is the rate of depreciation. We have taken annual compound growth rate of gross fixed capital formation of each sector during the period 1963-64 to 1970-71 as a measure of $g$. The rate of depreciation of capital stock in each sector has been taken from a study by Innovative Development Consultants (Pvt) Limited on Depreciation Rates in Pakistan; these are given in the following table.

**Table 8.2 Rates of Depreciation in Pakistan**

| Sector | Rate |
|---|---|
| Agriculture | 0.058 |
| Mining & Quarrying | 0.025 |
| Manufacturing | 0.071 |
| Construction | 0.025 |
| Electricity, Gas & Water Supply | 0.035 |
| Transport, Storage & Communication | 0.075 |
| Trade, Hotel & Restaurants | 0.038 |
| Finance & Insurance | 0.043 |
| Ownership of Dwellings | 0.052 |
| Public Admin & Defence | 0.035 |
| Other Services | 0.037 |

Source: Innovative Development Consultants (Pvt) Limited (2002), Study on Depreciation Rates in Pakistan

With the initial capital stock (for the year 1970-71), series of gross fixed capital formation at constant prices of 1999-00 and rates of depreciation for each sector in our hand, we have estimated sector-wise capital stock valued at constant prices. The overall capital stock has been worked out as the sum of the sectoral capital stocks. The sector-wise values of estimated capital stock for selected years are given in Table 8.3 (detail time series have been reported as annexure).

The results show that about 47 percent of the total capital stock has been employed in services sector which contributes about 50 percent of the total gross value added. On the other hand, the industrial sector also has more than 40 percent of the total capital stock, while its contribution to gross domestic product is 25 percent which indicates

marginal efficiency of capital lower in industrial sector than in services. The share of agriculture sector in total capital stock is just 10 percent.

The overall capital output ratio is about 2 and it has declined over time indicating increase in marginal efficiency of capital with the passage of time. Although industry has higher capital out ratio, a declining trend is visible in it. On the other hand, agriculture has the lowest capital output ratio indicating high marginal efficiency of capital but this ratio increased over time. The other sectors that showed increase in capital output ratio over time (hence decline in marginal efficiency of capital) included mining and quarrying and finance and insurance.

**Table 8.3 Estimates of Capital Stock**
(Rs million) (1999-00 prices)

| | 1970-71 | 1980-81 | 1990-91 | 1999-00 | 2004-05 |
|---|---|---|---|---|---|
| Agriculture | 176465 | 279353 | 590425 | 815833 | 894261 |
| Mining & Quarrying | 17980 | 27558 | 95664 | 233490 | 372667 |
| Manufacturing | 337006 | 412199 | 637718 | 1055141 | 1408336 |
| Construction | 575719 | 523427 | 493683 | 519437 | 509772 |
| Electricity, Gas & Water Supply | 100668 | 198325 | 443388 | 940595 | 1018928 |
| Total Industry | 1031374 | 1161509 | 1670454 | 2748664 | 3309703 |
| Transport, Storage & Communication | 142756 | 155121 | 276356 | 501171 | 721357 |
| Trade, Hotel & Restaurants | 48194 | 51383 | 51231 | 72785 | 107897 |
| Finance & Insurance | 8100 | 11758 | 23453 | 64770 | 116019 |
| Ownership of Dwellings | 175960 | 198463 | 452491 | 728502 | 931367 |
| Public Admin & Defence | 269232 | 411242 | 708516 | 1044580 | 1227957 |
| Other Services | 355946 | 497758 | 501265 | 624827 | 757054 |
| Total Services | 1000188 | 1325724 | 2013311 | 3036635 | 3861652 |
| Total GDP | 2208026 | 2766586 | 4274190 | 6601132 | 8065615 |
| | | | | | |
| ***Capital Output Ratio*** | | | | | |
| Agriculture | 0.5 | 0.6 | 0.9 | 0.9 | 0.9 |
| Mining & Quarrying | 2.1 | 1.9 | 2.2 | 4.8 | 5.7 |
| Manufacturing | 2.1 | 1.5 | 1.4 | 1.8 | 1.6 |
| Construction | 26.7 | 13.0 | 6.8 | 5.9 | 5.2 |
| Electricity, Gas & Water Supply | 5.9 | 5.8 | 5.7 | 6.7 | 6.3 |
| Total Industry | 5.0 | 3.1 | 2.5 | 3.2 | 2.7 |
| Transport, Storage & Communication | 3.0 | 1.4 | 1.2 | 1.2 | 1.5 |
| Trade, Hotel & Restaurants | 0.3 | 0.2 | 0.1 | 0.1 | 0.1 |
| Finance & Insurance | 0.2 | 0.3 | 0.2 | 0.5 | 0.6 |
| Ownership of Dwellings | 7.2 | 4.8 | 6.5 | 6.6 | 6.5 |
| Public Admin & Defence | 7.2 | 4.1 | 4.2 | 4.7 | 4.6 |
| Other Services | 6.5 | 5.2 | 2.8 | 1.9 | 1.7 |
| Total Services | 2.7 | 2.0 | 1.7 | 1.7 | 1.6 |
| Total GDP | 2.3 | 1.8 | 1.7 | 1.9 | 1.8 |

## 8.2 Labour

As mentioned above, we have taken skill-adjusted labour force in the production function which is defined as a product of number of employed workers and a human capital index (Collins and Bosworth, 1996), i.e. $L = H \cdot N$.

The sector-wise numbers of employed workers ($N$) have been worked out by combining information regarding percent distribution of employees by industry groups and total employed labour force (source: Statistical Years Books and Economic Survey, various issues).

There is no dispute that all employed workers are not identical in terms of productivity, instead worker personal characteristics influence marginal productivity. Some previous growth accounting studies have incorporated detailed adjustments by labor force groupings, including education, age, and gender (for example Denison (1967 and Young (1995)). We have followed a simpler approach, adjusting only for the characteristic that has been found to be the most important: *education*. The benefits of education are assumed to be embodied in workers, as explained by Collins and Bosworth, 1996.

The human capital index ($H$) has been constructed by using the estimates of the return to education as weights for aggregating workers across different educational levels. That is,

$$H = \sum R_i E_i$$

$R_i$ is return to education level $i$ (relative to no education) and $E_i$ is the ratio of employed workers with education level $i$. The return to education has been taken from Katsis, Mattson and Psacharopoulos (KMP) as reported by Psacharopoulos (2002), according to which every additional year of primary education adds 8.4 % to the income of workers, every additional year of secondary education adds 13.7 % and every additional year of higher education adds in the return to the extent of 31.2%. Table 8.4 gives the return to different levels of education worked out on the basis of

KMP results. We have taken a return of 1 for no education; every year of schooling then adds to it according to the above ratios.

**Table 8.4 Rates of Return to Education in Pakistan**

| Education level | Years of Schooling | Return ($R_i$) |
|---|---|---|
| Illiterate | | 1 |
| No formal education* | | 1.1 |
| Less than primary | 3 | 1.3 |
| Primary | 5 | 1.5 |
| Middle | 8 | 2.2 |
| Matric | 10 | 2.8 |
| Intermediate | 12 | 3.7 |
| BA | 14 | 6.3 |
| MA | 16 | 10.9 |
| M Phil/PhD | 18 | 18.8 |
| Others** | | 5.4 |

* average rate of return in Asian countries

** average of all education level (excluding illiterate)

Source: Author's calculation on the basis of results of Katsis, Mattson and Psacharopoulos (1999)

The distribution of employed workers with respect to the above education levels has been obtained from Household Income and Expenditure Survey, various issues. As HIES is not available for all the years of our sample, we have filled the gaps on pro rata basis.

The sector wise distribution of skill-adjusted labour force for selected years has been given in the Table 8.5 which shows that most of the labour force is engaged in agriculture activities followed by trade, hotel and restaurant sector and manufacturing. The electricity, gas and water supply has traditionally been the most capital intensive sector, however, mining and quarrying has emerged extremely capital intensive sector in recent years. The least capital intensity has been found in trade, hotel and restaurant sector.

| **Table 8.5 Estimates of Skill-adjusted Labour Force** (million numbers) | | | | | |
|---|---|---|---|---|---|
| | 1970-71 | 1980-81 | 1990-91 | 1999-00 | 2004-05 |
| Agriculture | 14.7 | 18.2 | 23.0 | 32.8 | 36.0 |
| Mining & Quarrying | 0.1 | 0.1 | 0.1 | 0.0 | 0.1 |
| Manufacturing | 3.8 | 3.2 | 5.9 | 7.8 | 11.6 |
| Construction | 1.0 | 1.4 | 3.2 | 3.9 | 4.9 |
| Electricity, Gas & Water Supply | 0.1 | 0.2 | 0.4 | 0.5 | 0.6 |
| Total Industry | 4.9 | 4.9 | 9.6 | 12.2 | 17.1 |
| Transport, Storage & Communication | 1.2 | 1.4 | 2.5 | 3.4 | 4.8 |
| Trade, Hotel & Restaurants | 2.8 | 3.2 | 6.4 | 9.1 | 12.5 |
| Finance & Insurance | 0.2 | 0.3 | 0.4 | 0.6 | 0.9 |
| Ownership of Dwellings | 0.4 | 1.1 | 1.8 | 2.9 | 4.2 |
| Public Admin & Defence | 0.7 | 2.4 | 2.8 | 4.2 | 5.5 |
| Other Services | 0.6 | 2.9 | 2.1 | 2.5 | 3.4 |
| Total Services | 5.9 | 11.3 | 16.0 | 22.7 | 31.2 |
| Total GDP | 25.6 | 34.5 | 48.6 | 67.7 | 84.3 |
| | | | | | |
| ***Capital Labour Ratio (000 rupees per labour)*** | | | | | |
| Agriculture | 12 | 15 | 26 | 25 | 25 |
| Mining & Quarrying | 270 | 200 | 1313 | 4928 | 6314 |
| Manufacturing | 88 | 131 | 107 | 136 | 122 |
| Construction | 592 | 363 | 154 | 133 | 104 |
| Electricity, Gas & Water Supply | 1573 | 959 | 1100 | 1985 | 1804 |
| Total Industry | 209 | 235 | 173 | 225 | 194 |
| Transport, Storage & Communication | 114 | 109 | 109 | 147 | 150 |
| Trade, Hotel & Restaurants | 17 | 16 | 8 | 8 | 9 |
| Finance & Insurance | 42 | 45 | 54 | 117 | 130 |
| Ownership of Dwellings | 414 | 173 | 257 | 249 | 223 |
| Public Admin & Defence | 414 | 173 | 257 | 249 | 223 |
| Other Services | 575 | 173 | 243 | 249 | 223 |
| Total Services | 169 | 117 | 126 | 134 | 124 |
| Total GDP | 86 | 80 | 88 | 98 | 96 |

## 8.3 Factors Shares

An important ingredient of growth accounting framework is estimates of the shares of labour and capital in total income as explained in detail in the next chapter 9. Since only two factors of productions have been assumed in a typical production function, it suffices to make some estimate of share of one of the factors in total income. This study takes an estimate of the share of labour in total income from information provided in Statistical Year Book, various issues; the Year Book reports sources of monthly household income which include wages and salaries, self employment, rent and other sources. As a share of labour in total income, we have summed share of wages and salaries and 60 percent of the self employment income; in case of self employment we assume that 60% of the income goes to labour and 40% to the capital (usually a self employed person puts more labour-hours in production process - up to

12 hours a day – as compared to other workers). Such data are available for selected years; we have worked out the share of labour for those years and averaged them out to have a constant number for our sample. The share of labour comes out to be 58.3% and thus the share of capital is 41.7 percent. The share of capital as worked out by this study is higher than assumed by Collins & Bosworth (1996) for South Asia (35%) and Guha-Khasnobis and Bari (2000) for Pakistan and other South Asian countries (33%); however, it is equal to the share estimated by Senhadji (1999) for South Asia (42%).

# 9 Factorization of GDP: Total Factor Productivity

Given the basic framework of growth accounting and the time series of capital stock and labour force along with their shares in total income as estimated in the previous chapter, this chapter estimates the total factor productivity for years from 1970-71 to 2004-05. As already mentioned, the term $A_t$ in the production function ($Y_t = A_t F(K_t, L_t)$) is termed as a measure of total factor productivity. In order to measure its value, Solow adopted a non-parametric approach (i.e. an approach that does not impose a specific form on production function). The solution is based on the total differential of the production function:[71]

$$dY = dA \cdot F(K,L) + \frac{\partial Y}{\partial K} dK + \frac{\partial Y}{\partial K} dL$$

$$\frac{dY}{Y} = \frac{dA}{A} + \left(\frac{\partial Y}{\partial K} \cdot \frac{K}{Y}\right)\frac{dK}{K} + \left(\frac{\partial Y}{\partial K} \cdot \frac{L}{Y}\right)\frac{dL}{L}$$

$$y = a + \varepsilon_k \cdot k + \varepsilon_l \cdot l \qquad (9.1)$$

$y$ is growth rate of output, $a$ the growth rate of TFP, $k$ and $l$ are growth rates of physical capital and labour, and $\varepsilon_k$ and $\varepsilon_l$ are output elasticities of capital and labour.

The output elasticities in (9.1) are not directly observable; however, if each input is paid the value of its marginal product,[72] i.e., if

$$\frac{\partial Y}{\partial K} = r \text{ ; and } \frac{\partial Y}{\partial L} = w \qquad (9.2)$$

then output elasticities can be measured as factor shares in total income, i.e.,

$$\varepsilon_k = \frac{rK}{Y} \text{ ; and } \varepsilon_l = \frac{wL}{Y} \qquad (9.3)$$

$r$ and $w$ are real returns to a unit of capital and labour. Thus (9.1) can be written as:

$$y = a + s_k \cdot k + s_l \cdot l \qquad (9.4)$$

and growth in total factor productivity can be computed as

$$a = y - s_k \cdot k - s_l \cdot l \qquad (9.5)$$

[71] For simplicity subscript $t$ has been removed.
[72] It only requires a degree of competition sufficient to ensure that the factors are paid their marginal products.

The information needed to get a value for growth in total factor productivity in a certain year *t* include output, physical capital, number of persons in employed labour force, index of labour quality and share of capital ($s_k$) or labour ($s_l$) in total income.[73] The earlier chapters of this dissertation have already estimated series of the required data for calculating total factor productivity: the value of output in the form of gross domestic product at 1999-00 prices has been estimated in chapter 4 by sectors, the value of capital stock at 1999-00 prices and skill-adjusted labour force along with factor shares have been estimated in chapter 8. Thus all the data with hand, TFP growth has been calculated for the period 1970-71 to 2004-05 and results have been analyzed in the following. Detailed results have been given as annexure.

### 9.1 Analysis of Results

It has been found that the contribution of total factor productivity to GDP growth during the period 1970-2005 had been 1 percentage point. It was higher in 1970s and early eighties and remained below 1 percent in subsequent years with negative growth during the periods of late 1980s and late 1990s. Resurgence in total factor productivity growth has been witnessed in recent years (Table 9.1).

Comparing the relative contribution of capital and labour, the results show that labour remained a biggest contributor to economic growth during this period (1970-2005); however, in recent years capital contribution has surpassed the labour contribution (see detail table in annexure).

**Table 9.1 Factorization of GDP Growth (1999-00 prices)**

| | GDP Growth | Share-weighted Growth of | | TFP | |
|---|---|---|---|---|---|
| | | Capital | Labour | Growth | % contribution |
| 1970-75 | 4.56 | 0.49 | 1.48 | 2.59 | 56.7 |
| 1975-80 | 5.47 | 1.26 | 2.07 | 2.14 | 39.1 |
| 1980-85 | 5.75 | 1.59 | 1.30 | 2.86 | 49.7 |
| 1985-90 | 4.66 | 2.03 | 2.98 | -0.36 | -7.7 |
| 1990-95 | 4.24 | 2.23 | 1.82 | 0.19 | 4.5 |
| 1995-00 | 3.20 | 1.83 | 2.27 | -0.90 | -28.0 |
| 2000-05 | 5.33 | 1.71 | 2.65 | 0.98 | 18.4 |
| Overall | 4.75 | 1.62 | 2.10 | 1.03 | 21.6 |

[73] As $s_k + s_l = 1$, we need to know only one of them.

The results of this study are different to those obtained by some other studies in case of Pakistan like Kemal (1992), Kemal, et al. (2002) and Guha-Khasnobis & Bari (2000) who found TFP contribution of -0.56, 1.66 and 2.03 respectively (Table 9.2). The results of Senhadji and Collins & Bosworth are however, closer to our results. A cross country comparison of the contribution of total factor productivity in economic growth has been made by Collins & Bosworth (1996) who find 0.9 for Indonesia, 1.4 for Malaysia, 3.1 for Singapore 3.1 and 0.9 for USA during the period 1984-94. They also quoted results of some other studies including Denison and Chung (1976) who found that TFP growth contributed from 1.9 to 4.9 percentage points per year to growth for nine industrial countries in various years between 1948-71, and Christenson et al. (1980) who found that the contribution of TFP to growth for eight industrial countries over selected period within 1947-73 ranged from 1.4 to 4.1 percentage points per year. With such a variety of results available in the literature, it is hard to give TFP in Pakistan some position at the performance scale.

**Table 9.2 Results of Other Studies**

| | **Period** | **TFP growth** | **% contribution** |
|---|---|---|---|
| Arby (2007); this study | 1970 - 2005 | 1.0 | 21.6 |
| Sabir and Ahmad (2003) | 1972-2001 | 1.8 | 35.3 |
| Kemal et al. (2002) | 1965 - 2001 | 1.66 | 31.26 |
| Pasha et al. (2002) | 1972-1998 | 2.2 | 40 |
| Mahmood and Siddiqui (2000) | | | |
| Guha-Khasnobis, and Faisal Bari (2000) | 1960 - 90 | 2.03 | 34.9 |
| Senhadji (1999)* | 1960 - 94 | 0.91 | 19.5 |
| Collins & Bosworth (1996) | 1960 - 94 | 0.4 to 1.0 | 17.4 to 43.5 |
| Kemal (1992) | 1950 - 91 | -0.56 | -11.0 |
| Burney (1986) | 1960-65<br>1965-70<br>1970-75<br>1975-80<br>1980-85 | | 54.5<br>58.1<br>33.6<br>23.2<br>43.4 |

* For South Asia, with share of capital in income 40%.

Table 9.3 reports results of our working for major sectors of the GDP. TFP contribution to growth of agriculture has been negative (-0.74 percent on average during 1970-2005); moreover contribution of labour remained lower than that of capital with the exception of the period of late 1990s and recent years. The contribution of TFP in industrial growth is 1.5 percent. It is interesting to note that contrary to the case of agriculture, the contribution of labour to growth of industrial

sector remained higher than that of capital with the exception of 1990s. In the case of services sector, the contribution of TFP growth is 0.94 percent. Moreover, the contribution of labour to services growth is higher than the contribution of capital during all the decades of the period 1970-2005.

**Table 9.3 Factors of Growth of Major Sectors**

| | GDP growth | Capital growth* | Labour growth* | TFP growth |
|---|---|---|---|---|
| | | Agriculture Sector | | |
| 1970-75 | 1.63 | 0.91 | 0.77 | -0.04 |
| 1975-80 | 3.41 | 2.67 | 1.59 | -0.86 |
| 1980-85 | 3.42 | 3.43 | 0.82 | -0.83 |
| 1985-90 | 3.56 | 3.18 | 2.49 | -2.11 |
| 1990-95 | 2.71 | 1.97 | 1.45 | -0.71 |
| 1995-00 | 3.13 | 1.23 | 2.71 | -0.81 |
| 2000-05 | 2.34 | 0.77 | 1.23 | 0.33 |
| Overall | 2.92 | 2.06 | 1.60 | -0.74 |
| | | Industrial Sector | | |
| 1970-75 | 5.01 | 0.04 | 1.48 | 3.49 |
| 1975-80 | 6.13 | 0.88 | 1.49 | 3.76 |
| 1980-85 | 8.34 | 0.91 | 3.59 | 3.85 |
| 1985-90 | 4.59 | 1.86 | 2.86 | -0.13 |
| 1990-95 | 4.02 | 2.66 | 1.15 | 0.21 |
| 1995-00 | 2.01 | 2.04 | 1.96 | -1.99 |
| 2000-05 | 7.34 | 1.58 | 4.07 | 1.70 |
| Overall | 5.36 | 1.46 | 2.40 | 1.50 |
| | | Services Sector | | |
| 1970-75 | 7.12 | 0.88 | 3.76 | 2.48 |
| 1975-80 | 6.74 | 1.35 | 3.51 | 1.88 |
| 1980-85 | 5.98 | 1.77 | 1.18 | 3.03 |
| 1985-90 | 5.36 | 1.88 | 4.23 | -0.75 |
| 1990-95 | 5.22 | 1.94 | 2.95 | 0.32 |
| 1995-00 | 3.83 | 1.81 | 1.93 | 0.10 |
| 2000-05 | 5.74 | 2.05 | 3.85 | -0.16 |
| Overall | 5.67 | 1.69 | 3.04 | 0.94 |

* growth rates multiplied by factor shares as weights.

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# *ANNEXURES*

# A Harvest Calendars of Crops

## Production in a Quarter as percent of Annual Production

### 1. Major Crops

| | Rice Basmati | Rice Irri/other | Wheat | Barley | Jowar | Bajra | Maize |
|---|---|---|---|---|---|---|---|
| **Punjab** | | | | | | | |
| Jul-Sep | 0 | 0.75 | 0 | 0 | 0.25 | 0.25 | 0 |
| Oct-Dec | 1 | 0.25 | 0 | 0 | 0.75 | 0.75 | 0.70 |
| Jan-Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Apr-Jun | 0 | 0 | 1 | 1 | 0 | 0 | 0.30 |
| **Sindh** | | | | | | | |
| Jul-Sep | 0 | 0.24 | 0 | 0 | 0.22 | 0.18 | 0.12 |
| Oct-Dec | 0 | 0.76 | 0 | 0 | 0.78 | 0.82 | 0.88 |
| Jan-Mar | 0 | 0 | 0.32 | 0.90 | 0 | 0 | 0 |
| Apr-Jun | 0 | 0 | 0.68 | 0.10 | 0 | 0 | 0 |
| **NWFP** | | | | | | | |
| Jul-Sep | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Oct-Dec | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| Jan-Mar | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| Apr-Jun | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| **Balochistan** | | | | | | | |
| Jul-Sep | 0.40 | 0.40 | 0.20 | 0 | 0.35 | 0 | 0.10 |
| Oct-Dec | 0.60 | 0.60 | 0 | 0 | 0.65 | 1.0 | 0.90 |
| Jan-Mar | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Apr-Jun | 0 | 0 | 0.80 | 1 | 0 | 0 | 0 |

| | Gram | Cotton | Sugarcane | Rapeseed & Mustard | Sesamum | Tobacco |
|---|---|---|---|---|---|---|
| **Punjab** | | | | | | |
| Jul-Sep | 0 | 0.25 | 0 | 0 | 0 | 0 |
| Oct-Dec | 0 | 0.70 | 0.15 | 0 | 1 | 0 |
| Jan-Mar | 0.15 | 0.05 | 0.80 | 0.85 | 0 | 0 |
| Apr-Jun | 0.85 | 0 | 0.05 | 0.15 | 0 | 1 |
| **Sindh** | | | | | | |
| Jul-Sep | 0 | 0.22 | 0 | 0 | 0 | 0 |
| Oct-Dec | 0 | 0.69 | 0.38 | 0 | 1 | 0 |
| Jan-Mar | 0.75 | 0.09 | 0.61 | 0.65 | 0 | 0.85 |
| Apr-Jun | 0.25 | 0 | 0.01 | 0.35 | 0 | 0.15 |
| **NWFP** | | | | | | |
| Jul-Sep | 0 | 0 | 0 | 0 | 0 | 0.25 |
| Oct-Dec | 0 | 1 | 0.50 | 0 | 0 | 0 |
| Jan-Mar | 0 | 0 | 0.50 | 0 | 1 | 0 |
| Apr-Jun | 1 | 0 | 0 | 1 | 0 | 0.75 |
| **Balochistan** | | | | | | |
| Jul-Sep | 0 | 0.70 | 0 | 0.25 | 0 | 0 |
| Oct-Dec | 0 | 0.30 | 0 | 0 | 1 | 0 |
| Jan-Mar | 1 | 0 | 1 | 0 | 0 | 0 |
| Apr-Jun | 0 | 0 | 0 | 0.75 | 0 | 1 |

**2. Minor Crops**

| | Mash | Masoor | Mung | Mattar | Other pulses | Tomato | Potato | Other vegetables |
|---|---|---|---|---|---|---|---|---|
| **Punjab** | | | | | | | | |
| Jul-Sep | | | | | | 0.10 | | 0.70 |
| Oct-Dec | 1.00 | | 1.00 | | | 0.10 | 0.35 | 0.10 |
| Jan-Mar | | | | | | 0.10 | 0.55 | 0.10 |
| Apr-Jun | | 1.00 | | 1.00 | 1.00 | 0.70 | 0.10 | 0.10 |
| **Sindh** | | | | | | | | |
| Jul-Sep | | | | | | 0.05 | | 0.70 |
| Oct-Dec | 1.00 | | 1.00 | | 0.40 | 0.20 | | 0.10 |
| Jan-Mar | | 0.70 | | 0.73 | 0.50 | 0.65 | 0.82 | 0.10 |
| Apr-Jun | | 0.30 | | 0.27 | 0.10 | 0.10 | 0.18 | 0.10 |
| **NWFP** | | | | | | | | |
| Jul-Sep | | | | | | | 1.00 | 0.70 |
| Oct-Dec | | | | | | 1.00 | | 0.10 |
| Jan-Mar | 1.00 | | 1.00 | | | | | 0.10 |
| Apr-Jun | | 1.00 | | 1.00 | 1.00 | | | 0.10 |
| **Balochistan** | | | | | | | | |
| Jul-Sep | | 0.20 | | 0.20 | | 0.18 | 0.40 | 0.70 |
| Oct-Dec | 1.00 | | 1.00 | | 1.00 | | 0.50 | 0.10 |
| Jan-Mar | | | | | | 0.32 | 0.10 | 0.10 |
| Apr-Jun | | 0.80 | | 0.80 | | 0.50 | | 0.10 |

| | Ground nuts | Soybean | Sunflower | Safflower | Canola | Linseed | Castro seed | Mango |
|---|---|---|---|---|---|---|---|---|
| **Punjab** | | | | | | | | |
| Jul-Sep | | | | | | | | 0.80 |
| Oct-Dec | 1.00 | | 0.05 | | 0.13 | | 0.35 | |
| Jan-Mar | | | 0.95 | | 0.16 | | 0.65 | |
| Apr-Jun | | 1.00 | | 1.00 | 0.71 | 1.00 | | 0.20 |
| **Sindh** | | | | | | | | |
| Jul-Sep | 0.35 | 0.15 | | | | | | 0.35 |
| Oct-Dec | 0.65 | 0.85 | 0.25 | | 0.13 | | 0.35 | |
| Jan-Mar | | | 0.35 | | 0.16 | 0.85 | 0.65 | |
| Apr-Jun | | | 0.40 | 1.00 | 0.71 | 0.15 | | 0.65 |
| **NWFP** | | | | | | | | |
| Jul-Sep | | 0.15 | | | 0.13 | | | 0.70 |
| Oct-Dec | | 0.85 | 0.25 | | 0.16 | | | 0.30 |
| Jan-Mar | 1.00 | | 0.35 | | 0.71 | | 0.35 | |
| Apr-Jun | | | 0.40 | 1.00 | | 1.00 | 0.65 | |
| **Balochistan** | | | | | | | | |
| Jul-Sep | | | 0.20 | 0.20 | | | | 0.55 |
| Oct-Dec | | 0.80 | | | 0.13 | | 0.35 | |
| Jan-Mar | 1.00 | 0.20 | | | 0.16 | | 0.65 | |
| Apr-Jun | | | 0.80 | 0.80 | 0.71 | | | 0.45 |

| | Banana | Apple | Citrus fruits | Dates | Guava | Apricot | Peach | Pomegranate |
|---|---|---|---|---|---|---|---|---|
| **Punjab** | | | | | | | | |
| Jul-Sep | | 1.00 | | 1.00 | 0.35 | 1.00 | 1.00 | 1.00 |
| Oct-Dec | 0.50 | | 0.25 | | 0.40 | | | |
| Jan-Mar | 0.25 | | 0.75 | | 0.20 | | | |
| Apr-Jun | 0.25 | | | | 0.05 | | | |
| **Sindh** | | | | | | | | |
| Jul-Sep | 0.15 | 1.00 | 0.40 | 0.70 | 0.10 | | | 1.00 |
| Oct-Dec | 0.42 | | 0.35 | | 0.40 | | | |
| Jan-Mar | 0.35 | | 0.20 | | 0.45 | | | |
| Apr-Jun | 0.08 | | 0.05 | 0.30 | 0.05 | | | |
| **NWFP** | | | | | | | | |
| Jul-Sep | | 0.50 | | 0.70 | | | 0.30 | 1.00 |
| Oct-Dec | 1.00 | 0.50 | 1.00 | | 0.50 | | | |
| Jan-Mar | | | | | | | | |
| Apr-Jun | | | | 0.30 | 0.50 | 1.00 | 0.70 | |
| **Balochistan** | | | | | | | | |
| Jul-Sep | 0.40 | 0.60 | 0.20 | 1.00 | | | 0.30 | 0.20 |
| Oct-Dec | 0.50 | 0.30 | 0.80 | | | | | 0.80 |
| Jan-Mar | | | | | 1.00 | | | |
| Apr-Jun | 0.10 | 0.10 | | | | 1.00 | 0.70 | |

| | Plums | Grapes | Pears | Almonds | Chilies | Onion | Garlic | Turmeric |
|---|---|---|---|---|---|---|---|---|
| **Punjab** | | | | | | | | |
| Jul-Sep | 1.00 | 0.50 | 1.00 | 0.40 | 1.00 | | 1.00 | |
| Oct-Dec | | | | 0.60 | | | | |
| Jan-Mar | | | | | | | | 1.00 |
| Apr-Jun | | 0.50 | | | | 1.00 | | |
| **Sindh** | | | | | | | | |
| Jul-Sep | | 0.35 | | | 0.30 | 0.05 | | 0.25 |
| Oct-Dec | | 0.65 | | | 0.45 | 0.45 | 0.45 | 0.75 |
| Jan-Mar | | | | | 0.15 | 0.35 | 0.50 | |
| Apr-Jun | | | | | 0.10 | 0.15 | 0.05 | |
| **NWFP** | | | | | | | | |
| Jul-Sep | 0.30 | | | 1.00 | 0.50 | 0.50 | | 0.60 |
| Oct-Dec | | | | | | | | |
| Jan-Mar | | | | | | | | |
| Apr-Jun | 0.70 | 1.00 | 1.00 | | 0.50 | 0.50 | 1.00 | 0.40 |
| **Balochistan** | | | | | | | | |
| Jul-Sep | 0.30 | | 0.70 | 0.60 | 0.80 | 0.20 | | |
| Oct-Dec | | | 0.30 | | | 0.55 | 0.45 | |
| Jan-Mar | | | | | 0.20 | 0.25 | 0.35 | |
| Apr-Jun | 0.70 | 1.00 | | 0.40 | | | 0.20 | |

| | Ginger | Other condiments | Guar seeds | Fodder crops | Sugar beet |
|---|---|---|---|---|---|
| **Punjab** | | | | | |
| Jul-Sep | | 0.15 | | 0.35 | 0.35 |
| Oct-Dec | | 0.35 | 1.00 | 0.15 | 0.15 |
| Jan-Mar | | 0.35 | | 0.35 | 0.35 |
| Apr-Jun | | 0.15 | | 0.15 | 0.15 |
| **Sindh** | | | | | |
| Jul-Sep | 0.45 | 0.15 | | 0.42 | 0.20 |
| Oct-Dec | 0.55 | 0.35 | 1.00 | 0.20 | 0.30 |
| Jan-Mar | | 0.35 | | 0.22 | 0.45 |
| Apr-Jun | | 0.15 | | 0.16 | 0.05 |
| **NWFP** | | | | | |
| Jul-Sep | | 0.15 | | 0.50 | 0.35 |
| Oct-Dec | | 0.35 | 1.00 | | 0.15 |
| Jan-Mar | | 0.35 | | | 0.35 |
| Apr-Jun | | 0.15 | | 0.50 | 0.15 |
| **Balochistan** | | | | | |
| Jul-Sep | | 0.15 | | 0.40 | 0.02 |
| Oct-Dec | | 0.35 | 1.00 | 0.15 | 0.40 |
| Jan-Mar | | 0.35 | | 0.35 | 0.40 |
| Apr-Jun | | 0.15 | | 0.10 | 0.18 |

## B Issues in Estimates of Livestock Population

We have estimated the time series of livestock population on the basis of four censuses of livestock, i.e., 1972, 1976, 1986, and 1996 and inter-census interpolation. The interpolation technique which we have adopted is different to that adopted by Ministry of Food, Agriculture and Livestock (MinFAL) and thus our series of livestock population is different to that reported in Agricultural Statistics of Pakistan. The MinFal's approach is the following:

- The annual compound growth rates of overall population of different animals in two censuses have been used for projecting inter-census population (at province level).
- The overall population thus estimated for inter-census years has been categorized into sub-categories of animals like Bulls at work, Cows in milk, Bulls < 3 years, etc on the basis of their shares in census year.

***Problem:*** Due to this method of interpolation, there are sudden jumps in the time series of different categories of animals, see for example Fig A1; as a consequence, the populations of key categories like 'animals in milk' and 'animals at work' are wrongly estimated. In order to make this point clear, look at the population of different categories of cattle as given in Table A1. As given in the table, before 1985-86 bulls at work and cows in milk were being estimated on the basis of their shares as per 1976 census (bulls at work were 39% of

**Fig A1: MinFAL Estimates of Key Categories of Cattle**

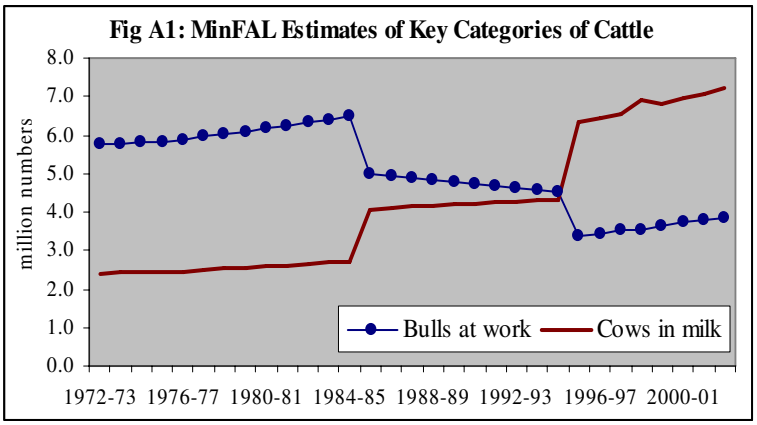
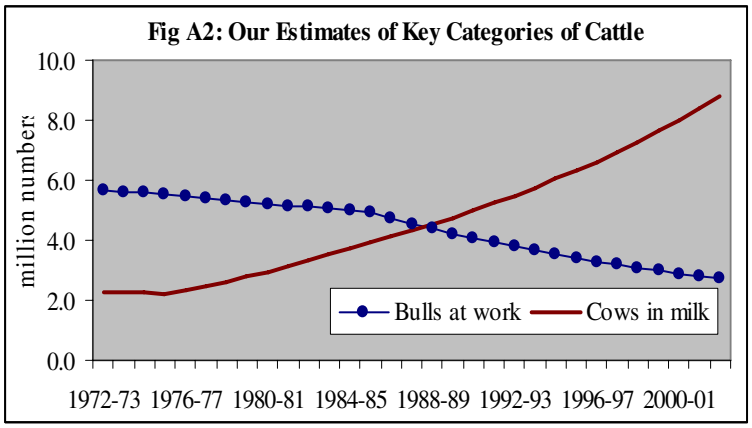



**Fig A2: Our Estimates of Key Categories of Cattle**



total and cows in milk were 16.4%). In 1985-86 census, the shares changed; bulls at work were 28.5% of total cattle and cows in milk were 23.3%. As a result the MinFal figures shows that in 1984-85 bulls at work are 6.5 million (39%) and the next year they suddenly became 5 million (28.5%) which may not be true. Similar is the case with cows in milk. Similar kinds of jumps can be seen in 1995-96 when new census data becomes available. There must be a gradual decline in the numbers of bulls at work and similarly a gradual increase in the numbers of cows in milk. There is another contrary to factual position in case of bulls at work: after a reduction of the number from 4.5 to 3.4 million in 1995-96, it starts rising in subsequent years. Theoretically, it should continue to decline as draught power is being replaced by mechanization.

***Solution***: We have projected the population of each animal by applying inter-census annual compound growth rates of each sub-category, and then aggregating them to get an estimate of overall population of the animal.[1] With this approach, there are gradual increase and decrease in the numbers of different categories and their shares (Fig A2). As an example, Tables A1 also gives our estimates of bulls at work which are declining gradually, and cows in milk which are increasing gradually.

**Table A1: Two Different Estimates of Cattle Population**
(million numbers)

| | MinFAL Estimates | | | | Our Estimates | | | |
|---|---|---|---|---|---|---|---|---|
| | Bulls at work | Cows in milk | Others | Total | Bulls at work | Cows in milk | Others | Total |
| 1982-83 | 6.3 | 2.7 | 7 | 16.2 | 5.1 | 3.3 | 8 | 15.9 |
| 1983-84 | 6.4 | 2.7 | 7 | 16.4 | 5.0 | 3.5 | 8 | 16.3 |
| 1984-85 | 6.5 | 2.7 | 7 | 16.5 | 5.0 | 3.7 | 8 | 16.7 |
| 1985-86 | 5.0 | 4.1 | 8 | 17.5 | 4.9 | 3.9 | 8 | 17.1 |
| 1986-87 | 4.9 | 4.1 | 9 | 17.6 | 4.7 | 4.1 | 8 | 17.3 |
| 1987-88 | 4.9 | 4.1 | 9 | 17.6 | 4.6 | 4.3 | 9 | 17.5 |
| 1992-93 | 4.6 | 4.3 | 9 | 17.8 | 3.8 | 5.5 | 10 | 19.1 |
| 1993-94 | 4.6 | 4.3 | 9 | 17.8 | 3.6 | 5.8 | 10 | 19.5 |
| 1994-95 | 4.5 | 4.3 | 9 | 17.8 | 3.5 | 6.0 | 10 | 19.9 |
| 1995-96 | 3.4 | 6.3 | 11 | 20.4 | 3.4 | 6.3 | 11 | 20.4 |
| 1996-97 | 3.45 | 6.4 | 11 | 20.8 | 3.3 | 6.6 | 11 | 21.0 |
| 1997-98 | 3.52 | 6.6 | 11 | 21.2 | 3.2 | 7.0 | 11 | 21.5 |
| 1998-99 | 3.52 | 6.9 | 11 | 21.6 | 3.1 | 7.3 | 12 | 22.1 |
| 1999-00 | 3.65 | 6.8 | 12 | 22.0 | 3.0 | 7.6 | 12 | 22.8 |

[1] This exercise was undertaken at provincial level, and then national level population was obtained by aggregation.

## C Derivation of an Expression for Initial Capital Stock

According to perpetual inventory method, the capital stock grows in the following fashion:

$K_0 = I_{-1} + (1-\delta)\, K_{-1}$ (1)

$K_0$ is the capital stock at the beginning of the year 0; $I_{-1}$ is gross fixed capital formation in previous year, and $K_{-1}$ is the capital stock at the beginning of the previous year which also grew according to (1), i.e.,

$K_{-1} = I_{-2} + (1-\delta)\, K_{-2}$ (1a)

Replacing $K_{-1}$ from (1a) into (1), we get

$K_0 = I_{-1} + (1-\delta)\, I_{-2} + (1-\delta)^2\, K_{-2}$ (2)

If we continue replacing past capital stocks perpetually, we can obtain

$K_0 = I_{-1} + (1-\delta)\ I_{-2} + (1-\delta)^2\, I_{-3} + (1-\delta)^3\, I_{-4} + \ldots$ (3)

Let investment increase with a constant growth rate (in a steady state), i.e.

$I_t = (1+g)\, I_{t-1} = (1+g)^2\, I_{t-2} = (1+g)^3\, I_{t-3} = (1+g)^4\, I_{t-4} = \ldots\ldots$

Where $g$ = growth rate of investment. Then (3) becomes

$K_0 = I_{-1}\ (\ 1 + \pi + \pi^2 + \pi^3 + \pi^4 + \ldots\ )$ (4)

Where $\pi = \dfrac{(1-\delta)}{(1+g)}$

$$K_0 = I_{-1}\left[\frac{1}{1-\pi}\right] = I_{-1}\left[\frac{1+g}{g+\delta}\right] = \frac{(1+g)\cdot I_{-1}}{g+\delta}$$

$$K_0 = \frac{I_0}{g+\delta} \qquad (5)$$

**Gross Domestic Product - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 207581 | 257864 | 235289 | 245257 | 945992 |
| 1971-72 | 217403 | 270121 | 239212 | 254551 | 981286 |
| 1972-73 | 234358 | 281519 | 257504 | 274837 | 1048217 |
| 1973-74 | 240464 | 300192 | 264743 | 296586 | 1101984 |
| 1974-75 | 236155 | 309888 | 282667 | 301593 | 1130304 |
| 1975-76 | 253088 | 310757 | 291384 | 304206 | 1159436 |
| 1976-77 | 263029 | 318635 | 300928 | 317235 | 1199828 |
| 1977-78 | 278213 | 349108 | 321408 | 340996 | 1289724 |
| 1978-79 | 291953 | 359444 | 343011 | 365256 | 1359664 |
| 1979-80 | 308862 | 399816 | 370040 | 394517 | 1473236 |
| 1980-81 | 329345 | 410898 | 384978 | 407199 | 1532420 |
| 1981-82 | 345361 | 445970 | 415086 | 424876 | 1631293 |
| 1982-83 | 377449 | 462378 | 439868 | 457047 | 1736742 |
| 1983-84 | 392969 | 472558 | 464037 | 460434 | 1789998 |
| 1984-85 | 417589 | 523092 | 502500 | 503539 | 1946721 |
| 1985-86 | 455869 | 548373 | 513837 | 537361 | 2055440 |
| 1986-87 | 479324 | 575007 | 541129 | 546613 | 2142073 |
| 1987-88 | 495646 | 604982 | 581883 | 572948 | 2255461 |
| 1988-89 | 518187 | 624990 | 605426 | 608421 | 2357024 |
| 1989-90 | 540921 | 663572 | 614718 | 624693 | 2443904 |
| 1990-91 | 563216 | 686667 | 642850 | 652321 | 2545054 |
| 1991-92 | 593580 | 732253 | 677926 | 691959 | 2695718 |
| 1992-93 | 623253 | 731820 | 706446 | 716887 | 2778407 |
| 1993-94 | 628956 | 755884 | 730954 | 732918 | 2848712 |
| 1994-95 | 655193 | 791240 | 779230 | 781065 | 3006727 |
| 1995-96 | 675703 | 825325 | 784004 | 795460 | 3080492 |
| 1996-97 | 690937 | 841042 | 783913 | 795689 | 3111582 |
| 1997-98 | 704171 | 861255 | 827535 | 835660 | 3228622 |
| 1998-99 | 728730 | 900778 | 829769 | 866636 | 3325913 |
| 1999-00 | 746178 | 957056 | 866280 | 944460 | 3513973 |
| 2000-01 | 788390 | 960531 | 904643 | 943314 | 3596878 |
| 2001-02 | 814676 | 989159 | 930889 | 981126 | 3715850 |
| 2002-03 | 834487 | 1033004 | 990289 | 1031182 | 3888962 |
| 2003-04 | 906484 | 1131478 | 1064147 | 1073913 | 4176022 |
| 2004-05 | 1004425 | 1266870 | 1148214 | 1130682 | 4550191 |

**Gross Value Added of Agriculture - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 76092 | 108475 | 86153 | 100984 | 371703 |
| 1971-72 | 80062 | 114309 | 85681 | 105191 | 385243 |
| 1972-73 | 80808 | 114805 | 87188 | 110148 | 392949 |
| 1973-74 | 82603 | 118273 | 91103 | 113530 | 405510 |
| 1974-75 | 80453 | 115815 | 88094 | 111736 | 396098 |
| 1975-76 | 80052 | 116680 | 91378 | 118420 | 406530 |
| 1976-77 | 80066 | 116660 | 96106 | 123540 | 416372 |
| 1977-78 | 85057 | 123842 | 97953 | 119821 | 426673 |
| 1978-79 | 86954 | 129075 | 101076 | 132107 | 449212 |
| 1979-80 | 88998 | 139728 | 103842 | 135580 | 468147 |
| 1980-81 | 89537 | 144343 | 110015 | 142818 | 486714 |
| 1981-82 | 93370 | 152846 | 116324 | 142470 | 505010 |
| 1982-83 | 97436 | 157494 | 117550 | 154427 | 526908 |
| 1983-84 | 96373 | 148280 | 119353 | 144282 | 508288 |
| 1984-85 | 105660 | 168261 | 123820 | 154229 | 551970 |
| 1985-86 | 110317 | 173825 | 125325 | 171565 | 581032 |
| 1986-87 | 116553 | 183896 | 130517 | 160478 | 591444 |
| 1987-88 | 117426 | 190255 | 133901 | 164750 | 606332 |
| 1988-89 | 119816 | 199530 | 140817 | 180703 | 640866 |
| 1989-90 | 124022 | 205068 | 143849 | 184107 | 657046 |
| 1990-91 | 127985 | 214485 | 147851 | 188158 | 678479 |
| 1991-92 | 135594 | 232897 | 152135 | 197385 | 718011 |
| 1992-93 | 129689 | 212699 | 150974 | 197097 | 690460 |
| 1993-94 | 136572 | 220259 | 158929 | 196364 | 712124 |
| 1994-95 | 140725 | 228357 | 166518 | 213426 | 749025 |
| 1995-96 | 146281 | 245727 | 169783 | 216834 | 778625 |
| 1996-97 | 147020 | 245727 | 171718 | 216611 | 781075 |
| 1997-98 | 149573 | 248212 | 181530 | 233781 | 813096 |
| 1998-99 | 154005 | 254279 | 186293 | 230778 | 825354 |
| 1999-00 | 158150 | 274219 | 187966 | 252813 | 873148 |
| 2000-01 | 161529 | 270979 | 186525 | 240337 | 859370 |
| 2001-02 | 159374 | 275114 | 192729 | 237696 | 864912 |
| 2002-03 | 160675 | 282049 | 198295 | 250411 | 891430 |
| 2003-04 | 162525 | 289983 | 202749 | 253881 | 909138 |
| 2004-05 | 177380 | 318133 | 205663 | 276713 | 977889 |

**Gross Value Added of Major Crops - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 12881 | 43928 | 21669 | 49873 | 128352 |
| 1971-72 | 14772 | 49050 | 20411 | 52808 | 137040 |
| 1972-73 | 14651 | 49074 | 20433 | 56921 | 141079 |
| 1973-74 | 14768 | 51066 | 23461 | 58781 | 148076 |
| 1974-75 | 13303 | 48553 | 20837 | 58321 | 141014 |
| 1975-76 | 12611 | 48251 | 23832 | 65158 | 149852 |
| 1976-77 | 12361 | 46750 | 26717 | 68951 | 154779 |
| 1977-78 | 15486 | 51322 | 26599 | 63483 | 156890 |
| 1978-79 | 14256 | 52451 | 25083 | 72562 | 164352 |
| 1979-80 | 16083 | 61410 | 25756 | 75423 | 178672 |
| 1980-81 | 14593 | 62687 | 28847 | 80537 | 186664 |
| 1981-82 | 15870 | 67329 | 31663 | 78295 | 193156 |
| 1982-83 | 16964 | 68654 | 29654 | 88087 | 203359 |
| 1983-84 | 13197 | 55568 | 28352 | 75882 | 173000 |
| 1984-85 | 20219 | 72172 | 29466 | 83516 | 205373 |
| 1985-86 | 21613 | 74615 | 27552 | 98130 | 221911 |
| 1986-87 | 23481 | 79542 | 28112 | 83526 | 214661 |
| 1987-88 | 23015 | 85236 | 29803 | 86294 | 224347 |
| 1988-89 | 22642 | 88711 | 32736 | 99724 | 243813 |
| 1989-90 | 22699 | 89810 | 31332 | 100266 | 244107 |
| 1990-91 | 24853 | 96881 | 32654 | 102314 | 256702 |
| 1991-92 | 31470 | 114253 | 36009 | 110722 | 292454 |
| 1992-93 | 23932 | 91257 | 32607 | 108544 | 256340 |
| 1993-94 | 23362 | 93371 | 35663 | 104303 | 256699 |
| 1994-95 | 23877 | 96791 | 38944 | 118311 | 277923 |
| 1995-96 | 28219 | 110073 | 38931 | 118767 | 295990 |
| 1996-97 | 26226 | 106177 | 36923 | 115982 | 285307 |
| 1997-98 | 27476 | 106230 | 44346 | 131858 | 309910 |
| 1998-99 | 26562 | 108182 | 44828 | 124755 | 304327 |
| 1999-00 | 32007 | 123863 | 41481 | 144654 | 342004 |
| 2000-01 | 31145 | 114875 | 36342 | 128552 | 310914 |
| 2001-02 | 26913 | 114768 | 38656 | 122587 | 302923 |
| 2002-03 | 27333 | 118661 | 41636 | 133701 | 321331 |
| 2003-04 | 28426 | 122564 | 42676 | 134941 | 328607 |
| 2004-05 | 36944 | 149061 | 43142 | 155295 | 384443 |

**Gross Value Added of Minor Crops - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 26547 | 12825 | 16692 | 13659 | 69724 |
| 1971-72 | 28504 | 13385 | 17271 | 14832 | 73992 |
| 1972-73 | 28554 | 12773 | 17534 | 14685 | 73546 |
| 1973-74 | 30111 | 14035 | 18218 | 16113 | 78477 |
| 1974-75 | 29918 | 14634 | 18556 | 15484 | 78593 |
| 1975-76 | 30598 | 16107 | 19303 | 15830 | 81838 |
| 1976-77 | 30034 | 15825 | 19554 | 16165 | 81577 |
| 1977-78 | 30326 | 15938 | 19192 | 16209 | 81664 |
| 1978-79 | 31178 | 16617 | 20456 | 16821 | 85072 |
| 1979-80 | 30629 | 16672 | 21147 | 16676 | 85124 |
| 1980-81 | 30739 | 17053 | 21484 | 16749 | 86025 |
| 1981-82 | 31879 | 18479 | 22817 | 17189 | 90365 |
| 1982-83 | 33039 | 18932 | 23445 | 17492 | 92909 |
| 1983-84 | 33784 | 19625 | 23624 | 17453 | 94485 |
| 1984-85 | 34057 | 19795 | 24076 | 17697 | 95624 |
| 1985-86 | 35245 | 19554 | 24414 | 18242 | 97455 |
| 1986-87 | 36515 | 20652 | 25175 | 18542 | 100885 |
| 1987-88 | 36423 | 18946 | 24710 | 18535 | 98615 |
| 1988-89 | 37587 | 22137 | 26259 | 19334 | 105317 |
| 1989-90 | 39467 | 23064 | 27312 | 19635 | 109478 |
| 1990-91 | 39569 | 22612 | 27449 | 19834 | 109463 |
| 1991-92 | 40189 | 22486 | 27680 | 20520 | 110874 |
| 1992-93 | 40080 | 22410 | 27396 | 20630 | 110516 |
| 1993-94 | 45767 | 24887 | 29496 | 22241 | 122392 |
| 1994-95 | 47531 | 26566 | 31129 | 23438 | 128664 |
| 1995-96 | 46461 | 27276 | 31368 | 24125 | 129229 |
| 1996-97 | 46882 | 27427 | 31874 | 24228 | 130411 |
| 1997-98 | 47157 | 27687 | 32608 | 24703 | 132156 |
| 1998-99 | 50300 | 28005 | 33448 | 26432 | 138185 |
| 1999-00 | 44539 | 25720 | 31933 | 23488 | 125680 |
| 2000-01 | 45362 | 25837 | 30521 | 23554 | 125274 |
| 2001-02 | 43460 | 24506 | 29316 | 22916 | 120199 |
| 2002-03 | 43037 | 24380 | 29240 | 23252 | 119910 |
| 2003-04 | 42067 | 25761 | 30276 | 23758 | 121863 |
| 2004-05 | 47170 | 24749 | 30822 | 25395 | 128137 |

**Gross Value Added of Livestock - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 34147 | 48212 | 44194 | 34147 | 160700 |
| 1971-72 | 34377 | 48546 | 44498 | 34377 | 161798 |
| 1972-73 | 34572 | 48863 | 44780 | 34572 | 162787 |
| 1973-74 | 34833 | 49268 | 45144 | 34833 | 164078 |
| 1974-75 | 35157 | 49755 | 45584 | 35157 | 165652 |
| 1975-76 | 35551 | 50331 | 46108 | 35551 | 167541 |
| 1976-77 | 35745 | 51261 | 46828 | 35745 | 169579 |
| 1977-78 | 36888 | 53182 | 48527 | 36888 | 175486 |
| 1978-79 | 38123 | 55236 | 50346 | 38123 | 181827 |
| 1979-80 | 39065 | 57072 | 51927 | 39065 | 187129 |
| 1980-81 | 40760 | 59652 | 54254 | 40760 | 195426 |
| 1981-82 | 42109 | 61972 | 56297 | 42109 | 202488 |
| 1982-83 | 43768 | 64635 | 58673 | 43768 | 210844 |
| 1983-84 | 45484 | 67414 | 61148 | 45484 | 219531 |
| 1984-85 | 47308 | 70359 | 63773 | 47308 | 228748 |
| 1985-86 | 49236 | 73469 | 66546 | 49236 | 238488 |
| 1986-87 | 52091 | 77145 | 69987 | 52091 | 251315 |
| 1987-88 | 53358 | 79261 | 71860 | 53358 | 257836 |
| 1988-89 | 54716 | 81504 | 73850 | 54716 | 264786 |
| 1989-90 | 56116 | 83830 | 75912 | 56116 | 271973 |
| 1990-91 | 57533 | 86221 | 78024 | 57533 | 279311 |
| 1991-92 | 58948 | 88659 | 80170 | 58948 | 286725 |
| 1992-93 | 60570 | 91340 | 82549 | 60570 | 295030 |
| 1993-94 | 62299 | 94173 | 85066 | 62299 | 303837 |
| 1994-95 | 64160 | 97184 | 87748 | 64160 | 313252 |
| 1995-96 | 67152 | 101288 | 91535 | 67152 | 327128 |
| 1996-97 | 69105 | 104507 | 94392 | 69105 | 337108 |
| 1997-98 | 70800 | 107557 | 97055 | 70800 | 346213 |
| 1998-99 | 72813 | 110966 | 100065 | 72813 | 356657 |
| 1999-00 | 74872 | 114493 | 103172 | 74872 | 367409 |
| 2000-01 | 77824 | 119506 | 107597 | 77824 | 382750 |
| 2001-02 | 81993 | 125284 | 112915 | 81993 | 402185 |
| 2002-03 | 82974 | 128200 | 115278 | 82974 | 409427 |
| 2003-04 | 84837 | 130985 | 117800 | 84837 | 418459 |
| 2004-05 | 87643 | 135622 | 121914 | 87643 | 432821 |

**Gross Value Added of Fishing - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 823 | 1350 | 1168 | 1158 | 4499 |
| 1971-72 | 632 | 1063 | 954 | 921 | 3570 |
| 1972-73 | 504 | 874 | 817 | 766 | 2960 |
| 1973-74 | 422 | 758 | 739 | 672 | 2590 |
| 1974-75 | 436 | 784 | 767 | 696 | 2683 |
| 1975-76 | 570 | 1071 | 1098 | 964 | 3703 |
| 1976-77 | 681 | 1237 | 1222 | 1101 | 4241 |
| 1977-78 | 740 | 1340 | 1318 | 1191 | 4590 |
| 1978-79 | 781 | 1435 | 1437 | 1282 | 4934 |
| 1979-80 | 764 | 1442 | 1487 | 1300 | 4994 |
| 1980-81 | 886 | 1688 | 1758 | 1526 | 5858 |
| 1981-82 | 937 | 1783 | 1854 | 1612 | 6185 |
| 1982-83 | 955 | 1817 | 1890 | 1642 | 6304 |
| 1983-84 | 1071 | 2057 | 2158 | 1864 | 7150 |
| 1984-85 | 1151 | 2205 | 2309 | 1997 | 7661 |
| 1985-86 | 1206 | 2342 | 2487 | 2130 | 8165 |
| 1986-87 | 1264 | 2477 | 2652 | 2259 | 8652 |
| 1987-88 | 1322 | 2594 | 2782 | 2367 | 9064 |
| 1988-89 | 1362 | 2706 | 2938 | 2479 | 9484 |
| 1989-90 | 1472 | 2923 | 3172 | 2677 | 10244 |
| 1990-91 | 1555 | 3066 | 3303 | 2802 | 10726 |
| 1991-92 | 1649 | 3244 | 3487 | 2962 | 11341 |
| 1992-93 | 1789 | 3462 | 3662 | 3146 | 12060 |
| 1993-94 | 1741 | 3490 | 3822 | 3206 | 12260 |
| 1994-95 | 1695 | 3401 | 3728 | 3125 | 11950 |
| 1995-96 | 1830 | 3751 | 4191 | 3467 | 13239 |
| 1996-97 | 1931 | 3948 | 4402 | 3648 | 13930 |
| 1997-98 | 1928 | 3919 | 4347 | 3614 | 13807 |
| 1998-99 | 2116 | 4303 | 4776 | 3969 | 15164 |
| 1999-00 | 2022 | 4139 | 4622 | 3826 | 14608 |
| 2000-01 | 2061 | 4213 | 4696 | 3891 | 14861 |
| 2001-02 | 2099 | 4298 | 4800 | 3973 | 15170 |
| 2002-03 | 1877 | 3854 | 4315 | 3565 | 13611 |
| 2003-04 | 1913 | 3938 | 4419 | 3646 | 13916 |
| 2004-05 | 1946 | 4013 | 4510 | 3717 | 14185 |

**Gross Value Added of Forestry - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 1693 | 2158 | 2429 | 2147 | 8428 |
| 1971-72 | 1777 | 2265 | 2549 | 2253 | 8843 |
| 1972-73 | 2527 | 3221 | 3625 | 3205 | 12577 |
| 1973-74 | 2469 | 3147 | 3542 | 3131 | 12290 |
| 1974-75 | 1638 | 2089 | 2350 | 2078 | 8156 |
| 1975-76 | 722 | 921 | 1036 | 916 | 3596 |
| 1976-77 | 1245 | 1587 | 1786 | 1579 | 6197 |
| 1977-78 | 1616 | 2060 | 2318 | 2049 | 8043 |
| 1978-79 | 2617 | 3336 | 3754 | 3319 | 13026 |
| 1979-80 | 2457 | 3132 | 3524 | 3116 | 12228 |
| 1980-81 | 2560 | 3263 | 3672 | 3247 | 12741 |
| 1981-82 | 2575 | 3282 | 3693 | 3265 | 12816 |
| 1982-83 | 2711 | 3455 | 3888 | 3438 | 13492 |
| 1983-84 | 2837 | 3617 | 4070 | 3598 | 14123 |
| 1984-85 | 2926 | 3730 | 4198 | 3711 | 14565 |
| 1985-86 | 3016 | 3845 | 4327 | 3825 | 15014 |
| 1986-87 | 3200 | 4080 | 4591 | 4059 | 15930 |
| 1987-88 | 3309 | 4218 | 4747 | 4197 | 16471 |
| 1988-89 | 3509 | 4473 | 5033 | 4450 | 17465 |
| 1989-90 | 4268 | 5440 | 6122 | 5413 | 21243 |
| 1990-91 | 4475 | 5705 | 6420 | 5676 | 22277 |
| 1991-92 | 3338 | 4255 | 4789 | 4234 | 16616 |
| 1992-93 | 3318 | 4229 | 4760 | 4208 | 16515 |
| 1993-94 | 3403 | 4338 | 4881 | 4316 | 16937 |
| 1994-95 | 3463 | 4414 | 4968 | 4392 | 17237 |
| 1995-96 | 2619 | 3339 | 3758 | 3322 | 13039 |
| 1996-97 | 2877 | 3667 | 4127 | 3649 | 14319 |
| 1997-98 | 2212 | 2820 | 3173 | 2805 | 11010 |
| 1998-99 | 2214 | 2823 | 3176 | 2808 | 11022 |
| 1999-00 | 4710 | 6005 | 6757 | 5974 | 23447 |
| 2000-01 | 5137 | 6549 | 7370 | 6515 | 25571 |
| 2001-02 | 4909 | 6258 | 7042 | 6226 | 24436 |
| 2002-03 | 5454 | 6953 | 7825 | 6918 | 27150 |
| 2003-04 | 5282 | 6734 | 7578 | 6699 | 26293 |
| 2004-05 | 3677 | 4688 | 5275 | 4664 | 18304 |

**Gross Value Added of Industry - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 47749 | 53725 | 56194 | 50516 | 208185 |
| 1971-72 | 48146 | 54133 | 55971 | 50417 | 208666 |
| 1972-73 | 52947 | 59193 | 61978 | 55676 | 229795 |
| 1973-74 | 57026 | 62784 | 66694 | 61052 | 247555 |
| 1974-75 | 57403 | 65148 | 68789 | 61054 | 252393 |
| 1975-76 | 60636 | 66608 | 71565 | 63884 | 262693 |
| 1976-77 | 62106 | 68495 | 75366 | 66718 | 272685 |
| 1977-78 | 67412 | 75966 | 81234 | 71408 | 296021 |
| 1978-79 | 70600 | 77839 | 85365 | 75893 | 309696 |
| 1979-80 | 78013 | 85258 | 93030 | 83110 | 339412 |
| 1980-81 | 84618 | 94491 | 100873 | 89240 | 369222 |
| 1981-82 | 93996 | 104025 | 111605 | 98990 | 408615 |
| 1982-83 | 100221 | 110602 | 118748 | 105164 | 434735 |
| 1983-84 | 104966 | 113606 | 124950 | 111104 | 454626 |
| 1984-85 | 115179 | 127167 | 139050 | 124557 | 505953 |
| 1985-86 | 124743 | 139937 | 142198 | 126994 | 533872 |
| 1986-87 | 130780 | 139681 | 150893 | 133720 | 555074 |
| 1987-88 | 134641 | 149871 | 166801 | 143475 | 594787 |
| 1988-89 | 143157 | 149018 | 167794 | 150925 | 610894 |
| 1989-90 | 149312 | 164907 | 168917 | 149693 | 632830 |
| 1990-91 | 155897 | 166532 | 180063 | 160510 | 663002 |
| 1991-92 | 160687 | 175161 | 191663 | 169685 | 697196 |
| 1992-93 | 161915 | 182512 | 200894 | 176911 | 722231 |
| 1993-94 | 167429 | 186753 | 204955 | 179514 | 738651 |
| 1994-95 | 174217 | 189969 | 215156 | 191220 | 770562 |
| 1995-96 | 175196 | 196744 | 212071 | 192527 | 776538 |
| 1996-97 | 180365 | 196946 | 207485 | 183373 | 768170 |
| 1997-98 | 180193 | 200885 | 221773 | 192653 | 795504 |
| 1998-99 | 191387 | 210752 | 226860 | 200811 | 829810 |
| 1999-00 | 191460 | 220315 | 228237 | 210201 | 850213 |
| 2000-01 | 200776 | 216639 | 244060 | 221161 | 882635 |
| 2001-02 | 209701 | 218984 | 248068 | 230517 | 907269 |
| 2002-03 | 210513 | 230198 | 267355 | 242411 | 950478 |
| 2003-04 | 240965 | 267983 | 302502 | 278943 | 1090392 |
| 2004-05 | 272102 | 297656 | 330758 | 305587 | 1206103 |

**Gross Value Added of Mining & Quarrying - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 2118 | 2083 | 2212 | 2259 | 8673 |
| 1971-72 | 2159 | 2123 | 2255 | 2303 | 8840 |
| 1972-73 | 2222 | 2128 | 2331 | 2269 | 8951 |
| 1973-74 | 2216 | 2148 | 2287 | 2501 | 9151 |
| 1974-75 | 2214 | 2267 | 2329 | 2327 | 9137 |
| 1975-76 | 2070 | 2217 | 2297 | 2427 | 9012 |
| 1976-77 | 2656 | 2898 | 3005 | 2945 | 11503 |
| 1977-78 | 2876 | 3107 | 3070 | 2954 | 12007 |
| 1978-79 | 2605 | 2996 | 3257 | 3302 | 12161 |
| 1979-80 | 2979 | 3155 | 3447 | 3259 | 12841 |
| 1980-81 | 3251 | 3676 | 3731 | 3496 | 14154 |
| 1981-82 | 3327 | 3763 | 4021 | 4188 | 15298 |
| 1982-83 | 3983 | 4215 | 4406 | 4300 | 16905 |
| 1983-84 | 3896 | 4381 | 4418 | 4672 | 17367 |
| 1984-85 | 4797 | 5711 | 6087 | 6039 | 22633 |
| 1985-86 | 7328 | 7046 | 7349 | 7521 | 29244 |
| 1986-87 | 7311 | 7824 | 7778 | 7791 | 30703 |
| 1987-88 | 7829 | 8334 | 9173 | 8342 | 33678 |
| 1988-89 | 8020 | 8248 | 8981 | 9433 | 34682 |
| 1989-90 | 8980 | 9830 | 9773 | 10053 | 38636 |
| 1990-91 | 10557 | 11384 | 11417 | 11019 | 44376 |
| 1991-92 | 10530 | 10943 | 11197 | 10925 | 43595 |
| 1992-93 | 10160 | 11228 | 11631 | 11091 | 44109 |
| 1993-94 | 11083 | 10955 | 11257 | 10673 | 43969 |
| 1994-95 | 9635 | 11046 | 11278 | 11253 | 43212 |
| 1995-96 | 10539 | 11619 | 11967 | 11602 | 45728 |
| 1996-97 | 11359 | 11909 | 11848 | 11547 | 46662 |
| 1997-98 | 11269 | 11805 | 11779 | 11781 | 46634 |
| 1998-99 | 11431 | 11640 | 11796 | 11295 | 46162 |
| 1999-00 | 11555 | 12293 | 12563 | 11905 | 48315 |
| 2000-01 | 12189 | 12424 | 10964 | 13026 | 48604 |
| 2001-02 | 11990 | 12666 | 12729 | 13864 | 51249 |
| 2002-03 | 14532 | 14840 | 14751 | 14847 | 58969 |
| 2003-04 | 14984 | 15477 | 14764 | 16253 | 61477 |
| 2004-05 | 15753 | 16379 | 15845 | 16940 | 64917 |

**Gross Value Added of Large-scale Manufacturing - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 28417 | 32558 | 33299 | 29257 | 123532 |
| 1971-72 | 28286 | 32409 | 33137 | 29117 | 122950 |
| 1972-73 | 30885 | 35386 | 36179 | 31783 | 134233 |
| 1973-74 | 32764 | 37520 | 38384 | 33707 | 142375 |
| 1974-75 | 32233 | 36917 | 37802 | 33213 | 140165 |
| 1975-76 | 32047 | 36744 | 37550 | 33010 | 139351 |
| 1976-77 | 31353 | 35931 | 36682 | 32245 | 136210 |
| 1977-78 | 34484 | 39506 | 40387 | 35443 | 149820 |
| 1978-79 | 35544 | 40601 | 41658 | 36514 | 154317 |
| 1979-80 | 39208 | 44932 | 46225 | 40717 | 171083 |
| 1980-81 | 44212 | 50979 | 51575 | 45464 | 192230 |
| 1981-82 | 50652 | 57902 | 58816 | 51685 | 219055 |
| 1982-83 | 54561 | 62407 | 64243 | 55909 | 237120 |
| 1983-84 | 56022 | 63050 | 65875 | 57397 | 242345 |
| 1984-85 | 61311 | 71432 | 74490 | 67213 | 274446 |
| 1985-86 | 65383 | 77658 | 72298 | 63982 | 279321 |
| 1986-87 | 67720 | 74158 | 76869 | 66503 | 285250 |
| 1987-88 | 67720 | 77694 | 85415 | 70898 | 301727 |
| 1988-89 | 70260 | 72799 | 82081 | 71926 | 297066 |
| 1989-90 | 71953 | 81689 | 76142 | 67453 | 297236 |
| 1990-91 | 71953 | 76065 | 78778 | 69721 | 296517 |
| 1991-92 | 71577 | 79377 | 83556 | 74492 | 309002 |
| 1992-93 | 70014 | 81128 | 85040 | 74599 | 310780 |
| 1993-94 | 70125 | 79455 | 83536 | 75072 | 308187 |
| 1994-95 | 70395 | 79006 | 85558 | 78296 | 313255 |
| 1995-96 | 73319 | 85883 | 88776 | 81340 | 329319 |
| 1996-97 | 74533 | 81546 | 83115 | 73104 | 312298 |
| 1997-98 | 72270 | 82235 | 90098 | 78392 | 322996 |
| 1998-99 | 74776 | 83522 | 92104 | 81502 | 331903 |
| 1999-00 | 75877 | 88595 | 89560 | 84569 | 338602 |
| 2000-01 | 85184 | 92317 | 104062 | 94124 | 375687 |
| 2001-02 | 89516 | 92133 | 106984 | 100226 | 388859 |
| 2002-03 | 92262 | 99537 | 118639 | 106517 | 416955 |
| 2003-04 | 106438 | 119598 | 138823 | 127774 | 492632 |
| 2004-05 | 127343 | 139577 | 157469 | 144936 | 569325 |

**Gross Value Added of Small-scale Manufacturing - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 4455 | 4781 | 4786 | 4510 | 18531 |
| 1971-72 | 4780 | 5130 | 5135 | 4839 | 19884 |
| 1972-73 | 5130 | 5505 | 5510 | 5191 | 21336 |
| 1973-74 | 5505 | 5906 | 5913 | 5568 | 22893 |
| 1974-75 | 5903 | 6335 | 6345 | 5981 | 24564 |
| 1975-76 | 6335 | 6802 | 6806 | 6415 | 26358 |
| 1976-77 | 6802 | 7299 | 7299 | 6881 | 28282 |
| 1977-78 | 7374 | 7912 | 7920 | 7452 | 30657 |
| 1978-79 | 7997 | 8571 | 8594 | 8070 | 33232 |
| 1979-80 | 8632 | 9268 | 9303 | 8822 | 36024 |
| 1980-81 | 9386 | 10111 | 10067 | 9486 | 39050 |
| 1981-82 | 10221 | 10932 | 10901 | 10275 | 42330 |
| 1982-83 | 11039 | 11836 | 11909 | 11102 | 45886 |
| 1983-84 | 11999 | 12793 | 12926 | 12022 | 49740 |
| 1984-85 | 12639 | 13693 | 13830 | 13757 | 53919 |
| 1985-86 | 14269 | 15622 | 14938 | 13618 | 58448 |
| 1986-87 | 15648 | 16153 | 16229 | 15328 | 63357 |
| 1987-88 | 16215 | 17608 | 18515 | 16341 | 68679 |
| 1988-89 | 17690 | 18329 | 18913 | 17394 | 72326 |
| 1989-90 | 18649 | 20301 | 19735 | 17483 | 76167 |
| 1990-91 | 19464 | 20576 | 21310 | 18860 | 80211 |
| 1991-92 | 19567 | 21699 | 22841 | 20364 | 84470 |
| 1992-93 | 20040 | 23221 | 24341 | 21353 | 88956 |
| 1993-94 | 21316 | 24152 | 25392 | 22819 | 93679 |
| 1994-95 | 22170 | 24881 | 26945 | 24658 | 98654 |
| 1995-96 | 23130 | 27094 | 28007 | 25661 | 103892 |
| 1996-97 | 26111 | 28569 | 29118 | 25611 | 109409 |
| 1997-98 | 25780 | 29335 | 32140 | 27964 | 115219 |
| 1998-99 | 27739 | 30983 | 34167 | 30234 | 123123 |
| 1999-00 | 29663 | 34634 | 35012 | 33061 | 132369 |
| 2000-01 | 32268 | 34970 | 39419 | 35654 | 142310 |
| 2001-02 | 35220 | 36250 | 42093 | 39434 | 152997 |
| 2002-03 | 36397 | 39267 | 46803 | 42021 | 164487 |
| 2003-04 | 38208 | 42932 | 49833 | 45867 | 176841 |
| 2004-05 | 42525 | 46610 | 52586 | 48400 | 190121 |

**Gross Value Added of Slaughtering - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 3379 | 4693 | 6571 | 4130 | 18773 |
| 1971-72 | 3797 | 5273 | 7382 | 4640 | 21092 |
| 1972-73 | 4307 | 5982 | 8375 | 5264 | 23930 |
| 1973-74 | 4857 | 6746 | 9444 | 5936 | 26983 |
| 1974-75 | 5393 | 7490 | 10486 | 6591 | 29960 |
| 1975-76 | 5985 | 8312 | 11637 | 7315 | 33248 |
| 1976-77 | 7135 | 9910 | 13874 | 8721 | 39641 |
| 1977-78 | 7551 | 10488 | 14683 | 9229 | 41950 |
| 1978-79 | 7957 | 11052 | 15472 | 9726 | 44207 |
| 1979-80 | 8363 | 11615 | 16262 | 10222 | 46462 |
| 1980-81 | 8816 | 12244 | 17142 | 10775 | 48976 |
| 1981-82 | 9229 | 12818 | 17945 | 11280 | 51272 |
| 1982-83 | 9716 | 13494 | 18892 | 11875 | 53976 |
| 1983-84 | 10439 | 14499 | 20299 | 12759 | 57996 |
| 1984-85 | 11236 | 15605 | 21847 | 13732 | 62420 |
| 1985-86 | 12038 | 16719 | 23406 | 14713 | 66875 |
| 1986-87 | 11653 | 16185 | 22659 | 14243 | 64741 |
| 1987-88 | 12732 | 17683 | 24756 | 15561 | 70731 |
| 1988-89 | 13927 | 19343 | 27081 | 17022 | 77373 |
| 1989-90 | 15049 | 20901 | 29261 | 18393 | 83603 |
| 1990-91 | 16275 | 22604 | 31646 | 19892 | 90417 |
| 1991-92 | 17690 | 24569 | 34397 | 21621 | 98276 |
| 1992-93 | 19466 | 27037 | 37851 | 23792 | 108147 |
| 1993-94 | 21111 | 29321 | 41049 | 25803 | 117284 |
| 1994-95 | 22659 | 31471 | 44059 | 27694 | 125884 |
| 1995-96 | 17137 | 23801 | 33321 | 20945 | 95204 |
| 1996-97 | 17809 | 24735 | 34629 | 21767 | 98941 |
| 1997-98 | 17982 | 24975 | 34965 | 21978 | 99899 |
| 1998-99 | 18609 | 25847 | 36185 | 22745 | 103386 |
| 1999-00 | 18704 | 25978 | 36369 | 22860 | 103910 |
| 2000-01 | 19447 | 27009 | 37813 | 23768 | 108037 |
| 2001-02 | 20156 | 27995 | 39192 | 24635 | 111979 |
| 2002-03 | 20910 | 29041 | 40658 | 25556 | 116164 |
| 2003-04 | 21740 | 30194 | 42271 | 26571 | 120775 |
| 2004-05 | 21850 | 30348 | 42487 | 26706 | 121390 |

**Gross Value Added of Construction - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Feb | Mar-Apr | Annual |
|---|---|---|---|---|---|
| 1970-71 | 5454 | 5454 | 5345 | 5311 | 21563 |
| 1971-72 | 5014 | 4851 | 3909 | 4263 | 18037 |
| 1972-73 | 5697 | 5217 | 4823 | 5140 | 20877 |
| 1973-74 | 6323 | 4859 | 5313 | 6657 | 23151 |
| 1974-75 | 6738 | 6942 | 6908 | 6738 | 27327 |
| 1975-76 | 9038 | 7055 | 8082 | 8133 | 32308 |
| 1976-77 | 8363 | 6369 | 8727 | 8696 | 32154 |
| 1977-78 | 8891 | 8426 | 8974 | 8591 | 34882 |
| 1978-79 | 9774 | 7622 | 9737 | 10032 | 37165 |
| 1979-80 | 11442 | 8644 | 10530 | 11130 | 41747 |
| 1980-81 | 10778 | 9033 | 10311 | 10219 | 40341 |
| 1981-82 | 12305 | 10085 | 11815 | 11652 | 45857 |
| 1982-83 | 12218 | 9697 | 10792 | 11544 | 44251 |
| 1983-84 | 12969 | 9046 | 12103 | 12854 | 46972 |
| 1984-85 | 15266 | 10573 | 13181 | 12048 | 51068 |
| 1985-86 | 14806 | 11791 | 13684 | 14361 | 54642 |
| 1986-87 | 16451 | 13174 | 15780 | 15856 | 61261 |
| 1987-88 | 16571 | 14884 | 15981 | 16652 | 64087 |
| 1988-89 | 18088 | 15089 | 16307 | 17769 | 67253 |
| 1989-90 | 17339 | 14828 | 17489 | 16631 | 66287 |
| 1990-91 | 18429 | 16684 | 18589 | 19353 | 73055 |
| 1991-92 | 20457 | 17745 | 19801 | 18868 | 76871 |
| 1992-93 | 20108 | 17837 | 20986 | 21301 | 80233 |
| 1993-94 | 20802 | 19852 | 21832 | 19272 | 81758 |
| 1994-95 | 22947 | 17293 | 22313 | 19886 | 82440 |
| 1995-96 | 22215 | 19734 | 22761 | 20988 | 85698 |
| 1996-97 | 22316 | 22099 | 22063 | 19924 | 86402 |
| 1997-98 | 22375 | 22254 | 23989 | 18719 | 87336 |
| 1998-99 | 23517 | 23913 | 19438 | 16221 | 83089 |
| 1999-00 | 21073 | 24545 | 22171 | 19600 | 87390 |
| 2000-01 | 22213 | 20384 | 23860 | 21576 | 88031 |
| 2001-02 | 25211 | 22278 | 20898 | 21437 | 89823 |
| 2002-03 | 21833 | 22749 | 23133 | 25759 | 93473 |
| 2003-04 | 21334 | 21349 | 20476 | 19485 | 82644 |
| 2004-05 | 25060 | 24986 | 24798 | 24140 | 98983 |

**Gross Value Added of Electricity, Gas & Water Supply - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 3926 | 4156 | 3981 | 5049 | 17113 |
| 1971-72 | 4109 | 4346 | 4153 | 5255 | 17863 |
| 1972-73 | 4706 | 4975 | 4759 | 6028 | 20469 |
| 1973-74 | 5361 | 5605 | 5353 | 6682 | 23001 |
| 1974-75 | 4920 | 5197 | 4919 | 6203 | 21239 |
| 1975-76 | 5162 | 5477 | 5193 | 6584 | 22417 |
| 1976-77 | 5797 | 6088 | 5778 | 7231 | 24894 |
| 1977-78 | 6236 | 6528 | 6201 | 7739 | 26704 |
| 1978-79 | 6722 | 6996 | 6647 | 8250 | 28615 |
| 1979-80 | 7389 | 7644 | 7263 | 8960 | 31256 |
| 1980-81 | 8176 | 8448 | 8048 | 9800 | 34472 |
| 1981-82 | 8262 | 8525 | 8106 | 9909 | 34802 |
| 1982-83 | 8704 | 8952 | 8507 | 10434 | 36597 |
| 1983-84 | 9640 | 9837 | 9329 | 11399 | 40206 |
| 1984-85 | 9931 | 10153 | 9616 | 11767 | 41467 |
| 1985-86 | 10919 | 11101 | 10522 | 12800 | 45342 |
| 1986-87 | 11997 | 12188 | 11578 | 13999 | 49762 |
| 1987-88 | 13574 | 13667 | 12962 | 15681 | 55884 |
| 1988-89 | 15172 | 15209 | 14431 | 17381 | 62193 |
| 1989-90 | 17343 | 17360 | 16517 | 19680 | 70900 |
| 1990-91 | 19219 | 19218 | 18323 | 21665 | 78425 |
| 1991-92 | 20867 | 20828 | 19872 | 23415 | 84981 |
| 1992-93 | 22126 | 22061 | 21045 | 24774 | 90005 |
| 1993-94 | 22992 | 23019 | 21887 | 25875 | 93774 |
| 1994-95 | 26412 | 26271 | 25002 | 29433 | 107117 |
| 1995-96 | 28855 | 28613 | 27238 | 31991 | 116697 |
| 1996-97 | 28236 | 28089 | 26712 | 31421 | 114457 |
| 1997-98 | 30517 | 30282 | 28803 | 33818 | 123420 |
| 1998-99 | 35316 | 34847 | 33171 | 38813 | 142148 |
| 1999-00 | 34588 | 34270 | 32563 | 38206 | 139627 |
| 2000-01 | 29476 | 29535 | 27942 | 33013 | 119966 |
| 2001-02 | 27607 | 27663 | 26171 | 30920 | 112362 |
| 2002-03 | 24580 | 24765 | 23374 | 27710 | 100429 |
| 2003-04 | 38262 | 38433 | 36335 | 42994 | 156024 |
| 2004-05 | 39571 | 39756 | 37573 | 44465 | 161366 |

**Gross Value Added of Services - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 83741 | 95664 | 92943 | 93756 | 366104 |
| 1971-72 | 89195 | 101679 | 97560 | 98943 | 387377 |
| 1972-73 | 100603 | 107520 | 108338 | 109013 | 425473 |
| 1973-74 | 100835 | 119135 | 106946 | 122004 | 448920 |
| 1974-75 | 98300 | 128926 | 125784 | 128803 | 481813 |
| 1975-76 | 112400 | 127469 | 128440 | 121903 | 490212 |
| 1976-77 | 120856 | 133481 | 129456 | 126977 | 510770 |
| 1977-78 | 125744 | 149300 | 142220 | 149766 | 567030 |
| 1978-79 | 134399 | 152530 | 156570 | 157255 | 600755 |
| 1979-80 | 141851 | 174830 | 173169 | 175827 | 665677 |
| 1980-81 | 155189 | 172064 | 174089 | 175141 | 676484 |
| 1981-82 | 157996 | 189099 | 187157 | 183417 | 717668 |
| 1982-83 | 179792 | 194281 | 203570 | 197456 | 775099 |
| 1983-84 | 191630 | 210672 | 219733 | 205048 | 827084 |
| 1984-85 | 196750 | 227665 | 239630 | 224753 | 888797 |
| 1985-86 | 220810 | 234611 | 246313 | 238802 | 940536 |
| 1986-87 | 231991 | 251430 | 259719 | 252416 | 995556 |
| 1987-88 | 243579 | 264857 | 281181 | 264724 | 1054341 |
| 1988-89 | 255214 | 276442 | 296815 | 276794 | 1105264 |
| 1989-90 | 267586 | 293596 | 301951 | 290893 | 1154027 |
| 1990-91 | 279334 | 305651 | 314936 | 303652 | 1203572 |
| 1991-92 | 297298 | 324195 | 334128 | 324889 | 1280511 |
| 1992-93 | 331649 | 336609 | 354578 | 342879 | 1365715 |
| 1993-94 | 324955 | 348872 | 367070 | 357039 | 1397936 |
| 1994-95 | 340250 | 372914 | 397556 | 376419 | 1487140 |
| 1995-96 | 354226 | 382854 | 402151 | 386098 | 1525329 |
| 1996-97 | 363552 | 398369 | 404710 | 395705 | 1562337 |
| 1997-98 | 374406 | 412158 | 424232 | 409226 | 1620021 |
| 1998-99 | 383338 | 435747 | 416615 | 435048 | 1670748 |
| 1999-00 | 396568 | 462521 | 450076 | 481446 | 1790612 |
| 2000-01 | 426086 | 472912 | 474058 | 481816 | 1854872 |
| 2001-02 | 445601 | 495062 | 490092 | 512914 | 1943668 |
| 2002-03 | 463298 | 520757 | 524639 | 538360 | 2047054 |
| 2003-04 | 502995 | 573513 | 558896 | 541089 | 2176492 |
| 2004-05 | 554942 | 651082 | 611794 | 548382 | 2366199 |

**Gross Value Added of Trade, and Hotels & Restaurants - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 36633 | 42725 | 43826 | 41742 | 164927 |
| 1971-72 | 38951 | 45358 | 45836 | 44434 | 174578 |
| 1972-73 | 42887 | 49773 | 51774 | 50647 | 195082 |
| 1973-74 | 44080 | 51816 | 57082 | 55500 | 208478 |
| 1974-75 | 45964 | 54148 | 56885 | 55404 | 212401 |
| 1975-76 | 46616 | 52835 | 55985 | 53966 | 209403 |
| 1976-77 | 45319 | 54279 | 58179 | 55616 | 213393 |
| 1977-78 | 48690 | 58128 | 61991 | 60680 | 229489 |
| 1978-79 | 52192 | 63474 | 68466 | 65888 | 250021 |
| 1979-80 | 57485 | 66494 | 71107 | 70956 | 266042 |
| 1980-81 | 61592 | 71942 | 75072 | 73469 | 282074 |
| 1981-82 | 64417 | 77638 | 80534 | 79498 | 302087 |
| 1982-83 | 69225 | 83638 | 86069 | 83549 | 322481 |
| 1983-84 | 71248 | 84316 | 91082 | 86539 | 333184 |
| 1984-85 | 80109 | 92949 | 97445 | 96162 | 366665 |
| 1985-86 | 84355 | 98447 | 100377 | 98583 | 381762 |
| 1986-87 | 86780 | 102836 | 104848 | 101765 | 396229 |
| 1987-88 | 87994 | 106981 | 112350 | 105361 | 412685 |
| 1988-89 | 89000 | 109950 | 118636 | 110822 | 428408 |
| 1989-90 | 92992 | 115920 | 118336 | 111281 | 438529 |
| 1990-91 | 94094 | 118921 | 121198 | 113738 | 447951 |
| 1991-92 | 105306 | 127555 | 131554 | 122501 | 486916 |
| 1992-93 | 106381 | 131431 | 136087 | 127830 | 501729 |
| 1993-94 | 110649 | 130185 | 137777 | 128769 | 507381 |
| 1994-95 | 112393 | 136246 | 143835 | 139279 | 531752 |
| 1995-96 | 116306 | 146073 | 149419 | 145581 | 557379 |
| 1996-97 | 121225 | 152299 | 150283 | 142701 | 566508 |
| 1997-98 | 119655 | 149902 | 154003 | 147718 | 571278 |
| 1998-99 | 121270 | 151359 | 156457 | 150277 | 579364 |
| 1999-00 | 126473 | 159363 | 161537 | 157401 | 604773 |
| 2000-01 | 135162 | 161868 | 172371 | 165415 | 634815 |
| 2001-02 | 140473 | 163495 | 176898 | 172431 | 653297 |
| 2002-03 | 144195 | 174839 | 192335 | 180398 | 691768 |
| 2003-04 | 156703 | 190626 | 206790 | 203786 | 757906 |
| 2004-05 | 177714 | 215219 | 233994 | 228402 | 855329 |

**Gross Value Added of Transport, Storage and Communication - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 11561 | 11778 | 12010 | 12257 | 47607 |
| 1971-72 | 12498 | 12734 | 12983 | 13248 | 51463 |
| 1972-73 | 13583 | 13911 | 14064 | 14040 | 55598 |
| 1973-74 | 13922 | 13877 | 14062 | 14477 | 56339 |
| 1974-75 | 14837 | 15105 | 15513 | 16061 | 61517 |
| 1975-76 | 16672 | 17224 | 17626 | 17877 | 69398 |
| 1976-77 | 18042 | 18269 | 18708 | 19360 | 74378 |
| 1977-78 | 20017 | 20587 | 21150 | 21704 | 83458 |
| 1978-79 | 22210 | 22720 | 23350 | 24100 | 92381 |
| 1979-80 | 24961 | 25769 | 26310 | 26581 | 103621 |
| 1980-81 | 26867 | 27260 | 27615 | 27929 | 109671 |
| 1981-82 | 28162 | 28413 | 28865 | 29518 | 114958 |
| 1982-83 | 30026 | 30457 | 31247 | 32398 | 124127 |
| 1983-84 | 33610 | 34676 | 35596 | 36373 | 140255 |
| 1984-85 | 37127 | 37942 | 38804 | 39716 | 153590 |
| 1985-86 | 40694 | 41650 | 42445 | 43081 | 167869 |
| 1986-87 | 43596 | 44179 | 45055 | 46224 | 179055 |
| 1987-88 | 47455 | 48567 | 49530 | 50345 | 195897 |
| 1988-89 | 51215 | 52144 | 52933 | 53581 | 209873 |
| 1989-90 | 54172 | 54821 | 55607 | 56529 | 221129 |
| 1990-91 | 57639 | 58688 | 59280 | 59415 | 235022 |
| 1991-92 | 59151 | 59081 | 59985 | 61863 | 240079 |
| 1992-93 | 63790 | 65321 | 66754 | 68090 | 263955 |
| 1993-94 | 69449 | 70846 | 72187 | 73471 | 285953 |
| 1994-95 | 75077 | 76698 | 77526 | 77561 | 306863 |
| 1995-96 | 77114 | 76999 | 78055 | 80282 | 312450 |
| 1996-97 | 82640 | 84521 | 86105 | 87395 | 340661 |
| 1997-98 | 88986 | 90691 | 91643 | 91843 | 363163 |
| 1998-99 | 91576 | 91626 | 92808 | 95122 | 371132 |
| 1999-00 | 97607 | 99628 | 101256 | 102491 | 400981 |
| 2000-01 | 104036 | 105733 | 106656 | 106803 | 423227 |
| 2001-02 | 106703 | 106922 | 107735 | 109141 | 430501 |
| 2002-03 | 110535 | 111690 | 112886 | 114125 | 449236 |
| 2003-04 | 124708 | 135465 | 121426 | 82592 | 464191 |
| 2004-05 | 129440 | 140859 | 126353 | 85922 | 482574 |

**Gross Value Added of Finance and Insurance - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 7076 | 12452 | 7707 | 10099 | 37334 |
| 1971-72 | 7648 | 13240 | 7657 | 9897 | 38443 |
| 1972-73 | 11595 | 11030 | 8871 | 10393 | 41889 |
| 1973-74 | 7502 | 17822 | -743 | 15156 | 39737 |
| 1974-75 | -3270 | 18591 | 11152 | 14756 | 41229 |
| 1975-76 | 7443 | 15374 | 11694 | 6689 | 41199 |
| 1976-77 | 13542 | 16791 | 7197 | 6071 | 43602 |
| 1977-78 | 9135 | 22171 | 9257 | 17184 | 57748 |
| 1978-79 | 9400 | 15452 | 12274 | 13912 | 51038 |
| 1979-80 | 4683 | 26915 | 18524 | 20999 | 71122 |
| 1980-81 | 8149 | 14109 | 11123 | 12969 | 46351 |
| 1981-82 | 4882 | 22123 | 15132 | 11184 | 53322 |
| 1982-83 | 15492 | 14608 | 18760 | 13380 | 62239 |
| 1983-84 | 17204 | 21526 | 20808 | 9169 | 68708 |
| 1984-85 | 6311 | 22882 | 27304 | 12090 | 68586 |
| 1985-86 | 18138 | 16225 | 22872 | 15649 | 72885 |
| 1986-87 | 18994 | 20941 | 23899 | 17771 | 81605 |
| 1987-88 | 20956 | 21388 | 28881 | 17778 | 89004 |
| 1988-89 | 21905 | 20437 | 28695 | 15079 | 86116 |
| 1989-90 | 23136 | 24823 | 27261 | 21452 | 96672 |
| 1990-91 | 25734 | 25398 | 28872 | 23734 | 103737 |
| 1991-92 | 25763 | 29356 | 31310 | 28247 | 114676 |
| 1992-93 | 49202 | 26576 | 35339 | 29465 | 140582 |
| 1993-94 | 27825 | 29767 | 35804 | 32268 | 125664 |
| 1994-95 | 29690 | 35612 | 48604 | 31106 | 145012 |
| 1995-96 | 32376 | 30526 | 42033 | 26095 | 131030 |
| 1996-97 | 25555 | 26094 | 29165 | 24924 | 105739 |
| 1997-98 | 24838 | 29160 | 32359 | 21916 | 108272 |
| 1998-99 | 22418 | 43238 | 13839 | 34374 | 113869 |
| 1999-00 | 13199 | 42498 | 22009 | 54747 | 132453 |
| 2000-01 | 20065 | 37003 | 22379 | 35009 | 114455 |
| 2001-02 | 20880 | 45310 | 21384 | 45187 | 132761 |
| 2002-03 | 18385 | 41915 | 22236 | 45068 | 127604 |
| 2003-04 | 22366 | 46596 | 24909 | 46895 | 140766 |
| 2004-05 | 27906 | 60681 | 31061 | 62251 | 181899 |

**Gross Value Added of Ownership of Dwelling - Quarterly**
(1999-00 prices)

(Rs Million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 6014 | 6090 | 6169 | 6251 | 24523 |
| 1971-72 | 6332 | 6412 | 6495 | 6582 | 25822 |
| 1972-73 | 6668 | 6752 | 6840 | 6931 | 27191 |
| 1973-74 | 7021 | 7110 | 7202 | 7299 | 28632 |
| 1974-75 | 7394 | 7487 | 7584 | 7686 | 30151 |
| 1975-76 | 7786 | 7884 | 7987 | 8094 | 31750 |
| 1976-77 | 8199 | 8302 | 8411 | 8523 | 33435 |
| 1977-78 | 8634 | 8743 | 8857 | 8976 | 35210 |
| 1978-79 | 9093 | 9207 | 9327 | 9453 | 37080 |
| 1979-80 | 9576 | 9697 | 9823 | 9955 | 39050 |
| 1980-81 | 10085 | 10212 | 10345 | 10484 | 41126 |
| 1981-82 | 10621 | 10755 | 10895 | 11042 | 43312 |
| 1982-83 | 11185 | 11327 | 11475 | 11629 | 45616 |
| 1983-84 | 11781 | 11930 | 12085 | 12248 | 48044 |
| 1984-85 | 12408 | 12565 | 12729 | 12900 | 50601 |
| 1985-86 | 13068 | 13234 | 13407 | 13587 | 53296 |
| 1986-87 | 13764 | 13939 | 14121 | 14311 | 56135 |
| 1987-88 | 14498 | 14681 | 14873 | 15074 | 59126 |
| 1988-89 | 15271 | 15464 | 15666 | 15878 | 62279 |
| 1989-90 | 16085 | 16289 | 16502 | 16725 | 65601 |
| 1990-91 | 16943 | 17158 | 17383 | 17617 | 69101 |
| 1991-92 | 17847 | 18074 | 18311 | 18558 | 72789 |
| 1992-93 | 18800 | 19039 | 19288 | 19549 | 76676 |
| 1993-94 | 19804 | 20056 | 20319 | 20593 | 80772 |
| 1994-95 | 20863 | 21128 | 21405 | 21694 | 85089 |
| 1995-96 | 21978 | 22257 | 22549 | 22854 | 89639 |
| 1996-97 | 23153 | 23448 | 23755 | 24077 | 94433 |
| 1997-98 | 24392 | 24702 | 25027 | 25365 | 99486 |
| 1998-99 | 25698 | 26025 | 26366 | 26723 | 104812 |
| 1999-00 | 27074 | 27418 | 27779 | 28155 | 110425 |
| 2000-01 | 28524 | 28887 | 29267 | 29663 | 116341 |
| 2001-02 | 30053 | 30435 | 30836 | 31253 | 122577 |
| 2002-03 | 31664 | 32067 | 32489 | 32930 | 129150 |
| 2003-04 | 33362 | 33787 | 34232 | 34696 | 136078 |
| 2004-05 | 38325 | 41870 | 37618 | 25568 | 143381 |

**Gross Value Added of Public Administration & Defence - Quarterly**
(1999-00 prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 9102 | 9102 | 9544 | 9544 | 37293 |
| 1971-72 | 9731 | 9731 | 10204 | 10204 | 39870 |
| 1972-73 | 11106 | 11106 | 11644 | 11644 | 45499 |
| 1973-74 | 12749 | 12749 | 13367 | 13367 | 52230 |
| 1974-75 | 16944 | 16944 | 17767 | 17767 | 69423 |
| 1975-76 | 16481 | 16481 | 17280 | 17280 | 67523 |
| 1976-77 | 17704 | 17704 | 18561 | 18561 | 72531 |
| 1977-78 | 19946 | 19946 | 20911 | 20911 | 81712 |
| 1978-79 | 21055 | 21055 | 22072 | 22072 | 86255 |
| 1979-80 | 22387 | 22387 | 23467 | 23467 | 91708 |
| 1980-81 | 24764 | 24764 | 25957 | 25957 | 101442 |
| 1981-82 | 25262 | 25262 | 26473 | 26473 | 103471 |
| 1982-83 | 27735 | 27735 | 29067 | 29067 | 113604 |
| 1983-84 | 29898 | 29898 | 31336 | 31336 | 122467 |
| 1984-85 | 30851 | 30851 | 32334 | 32334 | 126371 |
| 1985-86 | 32505 | 32505 | 34066 | 34066 | 133141 |
| 1986-87 | 34304 | 34304 | 35951 | 35951 | 140510 |
| 1987-88 | 35744 | 35744 | 37459 | 37459 | 146405 |
| 1988-89 | 38480 | 38480 | 40331 | 40331 | 157621 |
| 1989-90 | 39573 | 39573 | 41474 | 41474 | 162093 |
| 1990-91 | 40908 | 40908 | 42872 | 42872 | 167561 |
| 1991-92 | 41980 | 41980 | 43995 | 43995 | 171949 |
| 1992-93 | 43012 | 43012 | 45076 | 45076 | 176178 |
| 1993-94 | 43557 | 43557 | 45650 | 45650 | 178414 |
| 1994-95 | 44900 | 44900 | 47059 | 47059 | 183918 |
| 1995-96 | 46271 | 46271 | 48498 | 48498 | 189539 |
| 1996-97 | 47031 | 47031 | 49307 | 49307 | 192677 |
| 1997-98 | 48027 | 48027 | 50350 | 50350 | 196754 |
| 1998-99 | 49216 | 49216 | 51596 | 51596 | 201623 |
| 1999-00 | 53805 | 53805 | 56409 | 56409 | 220429 |
| 2000-01 | 54985 | 54985 | 57619 | 57619 | 225207 |
| 2001-02 | 58694 | 58694 | 61499 | 61499 | 240386 |
| 2002-03 | 63335 | 63335 | 66345 | 66345 | 259359 |
| 2003-04 | 65298 | 65298 | 68416 | 68416 | 267427 |
| 2004-05 | 65647 | 65647 | 68778 | 68778 | 268849 |

**Gross Value Added of Social, Community & Personal Services**
**Quarterly**

(1999-00 prices) (Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 13354 | 13517 | 13686 | 13863 | 54420 |
| 1971-72 | 14035 | 14204 | 14385 | 14578 | 57201 |
| 1972-73 | 14765 | 14948 | 15145 | 15356 | 60214 |
| 1973-74 | 15561 | 15761 | 15976 | 16206 | 63503 |
| 1974-75 | 16431 | 16650 | 16882 | 17128 | 67092 |
| 1975-76 | 17402 | 17671 | 17869 | 17997 | 70939 |
| 1976-77 | 18051 | 18135 | 18400 | 18845 | 73431 |
| 1977-78 | 19322 | 19725 | 20055 | 20311 | 79413 |
| 1978-79 | 20449 | 20620 | 21080 | 21830 | 83980 |
| 1979-80 | 22759 | 23568 | 23938 | 23869 | 94134 |
| 1980-81 | 23734 | 23777 | 23977 | 24332 | 95820 |
| 1981-82 | 24651 | 24907 | 25257 | 25702 | 100517 |
| 1982-83 | 26129 | 26518 | 26952 | 27432 | 107031 |
| 1983-84 | 27889 | 28327 | 28826 | 29384 | 114425 |
| 1984-85 | 29943 | 30477 | 31013 | 31551 | 122984 |
| 1985-86 | 32051 | 32551 | 33146 | 33836 | 131584 |
| 1986-87 | 34553 | 35230 | 35844 | 36394 | 142021 |
| 1987-88 | 36932 | 37496 | 38088 | 38708 | 151223 |
| 1988-89 | 39343 | 39967 | 40554 | 41104 | 160967 |
| 1989-90 | 41629 | 42170 | 42771 | 43433 | 170004 |
| 1990-91 | 44016 | 44578 | 45331 | 46276 | 180201 |
| 1991-92 | 47252 | 48149 | 48974 | 49726 | 194101 |
| 1992-93 | 50464 | 51231 | 52032 | 52868 | 206595 |
| 1993-94 | 53671 | 54461 | 55333 | 56288 | 219752 |
| 1994-95 | 57327 | 58330 | 59128 | 59721 | 234506 |
| 1995-96 | 60181 | 60727 | 61596 | 62788 | 245293 |
| 1996-97 | 63947 | 64976 | 66094 | 67301 | 262320 |
| 1997-98 | 68507 | 69676 | 70851 | 72034 | 281068 |
| 1998-99 | 73160 | 74284 | 75549 | 76955 | 299947 |
| 1999-00 | 78411 | 79809 | 81087 | 82244 | 321551 |
| 2000-01 | 83315 | 84436 | 85768 | 87308 | 340826 |
| 2001-02 | 88799 | 90205 | 91740 | 93403 | 364147 |
| 2002-03 | 95184 | 96911 | 98348 | 99495 | 389937 |
| 2003-04 | 100558 | 101740 | 103123 | 104704 | 410125 |
| 2004-05 | 115910 | 126806 | 113990 | 77461 | 434167 |

**Gross Domestic Product - Quarterly**
(current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 14036 | 17176 | 15866 | 17037 | 64114 |
| 1971-72 | 15448 | 19272 | 17349 | 18917 | 70986 |
| 1972-73 | 17975 | 21906 | 20951 | 24152 | 84984 |
| 1973-74 | 23643 | 31112 | 27984 | 33831 | 116570 |
| 1974-75 | 30274 | 40663 | 38168 | 42826 | 151931 |
| 1975-76 | 37082 | 46094 | 43710 | 47100 | 173986 |
| 1976-77 | 42740 | 52293 | 50547 | 53695 | 199275 |
| 1977-78 | 48350 | 58813 | 54971 | 58173 | 220306 |
| 1978-79 | 52508 | 63691 | 61919 | 67601 | 245719 |
| 1979-80 | 61017 | 77013 | 72616 | 80356 | 291002 |
| 1980-81 | 70872 | 89469 | 85428 | 94306 | 340075 |
| 1981-82 | 84341 | 107731 | 101414 | 105236 | 398721 |
| 1982-83 | 96629 | 117700 | 113244 | 120012 | 447586 |
| 1983-84 | 109804 | 131825 | 134455 | 132299 | 508383 |
| 1984-85 | 124732 | 153085 | 147338 | 148963 | 574118 |
| 1985-86 | 141775 | 168227 | 159797 | 166326 | 636124 |
| 1986-87 | 154111 | 184758 | 178087 | 182558 | 699515 |
| 1987-88 | 176156 | 210887 | 206889 | 206336 | 800268 |
| 1988-89 | 201395 | 238033 | 235042 | 241026 | 915496 |
| 1989-90 | 222619 | 268656 | 253624 | 263104 | 1008002 |
| 1990-91 | 258310 | 314227 | 304442 | 315550 | 1192528 |
| 1991-92 | 301164 | 367014 | 347155 | 360413 | 1375746 |
| 1992-93 | 336672 | 392586 | 388186 | 398043 | 1515488 |
| 1993-94 | 367837 | 447234 | 455273 | 483045 | 1753388 |
| 1994-95 | 436317 | 540065 | 550017 | 557242 | 2083640 |
| 1995-96 | 498591 | 621569 | 609168 | 631989 | 2361317 |
| 1996-97 | 566517 | 706195 | 691109 | 709948 | 2673769 |
| 1997-98 | 630145 | 786402 | 757635 | 776764 | 2950946 |
| 1998-99 | 690938 | 867930 | 808401 | 1023326 | 3390595 |
| 1999-00 | 733524 | 946578 | 868494 | 968377 | 3516973 |
| 2000-01 | 832719 | 1034602 | 981901 | 1025742 | 3874963 |
| 2001-02 | 895567 | 1076264 | 1020694 | 1087545 | 4080070 |
| 2002-03 | 941682 | 1170450 | 1147704 | 1199550 | 4459386 |
| 2003-04 | 1071669 | 1387905 | 1333014 | 1372437 | 5165025 |
| 2004-05 | 959471 | 1221655 | 1151602 | 1241568 | 4574296 |

**Gross Value Added of Agriculture - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 5735 | 7576 | 6102 | 7455 | 26868 |
| 1971-72 | 6214 | 8664 | 6663 | 8362 | 29902 |
| 1972-73 | 6596 | 9316 | 7481 | 10744 | 34137 |
| 1973-74 | 9048 | 13340 | 10778 | 14472 | 47637 |
| 1974-75 | 11285 | 16169 | 13090 | 17153 | 57696 |
| 1975-76 | 12842 | 18394 | 14880 | 19668 | 65785 |
| 1976-77 | 14812 | 20766 | 17744 | 22442 | 75763 |
| 1977-78 | 16906 | 23322 | 19330 | 22929 | 82487 |
| 1978-79 | 17685 | 25149 | 20670 | 27098 | 90602 |
| 1979-80 | 20414 | 28845 | 21955 | 29461 | 100675 |
| 1980-81 | 21597 | 33245 | 26533 | 36276 | 117652 |
| 1981-82 | 26985 | 40284 | 32444 | 39584 | 139297 |
| 1982-83 | 29727 | 44179 | 34623 | 44625 | 153155 |
| 1983-84 | 32528 | 45633 | 38073 | 46408 | 162642 |
| 1984-85 | 38486 | 54560 | 42014 | 50238 | 185298 |
| 1985-86 | 40036 | 57262 | 43862 | 56563 | 197721 |
| 1986-87 | 43436 | 62781 | 48444 | 58040 | 212701 |
| 1987-88 | 50302 | 71037 | 54551 | 64856 | 240747 |
| 1988-89 | 57458 | 82110 | 62954 | 78559 | 281081 |
| 1989-90 | 61175 | 88664 | 67107 | 83891 | 300837 |
| 1990-91 | 68845 | 102415 | 77567 | 97376 | 346203 |
| 1991-92 | 79189 | 121409 | 85803 | 110479 | 396880 |
| 1992-93 | 82745 | 122281 | 93936 | 118022 | 416985 |
| 1993-94 | 92957 | 138280 | 112145 | 145579 | 488961 |
| 1994-95 | 106985 | 169060 | 133341 | 168919 | 578305 |
| 1995-96 | 123309 | 195324 | 142316 | 183504 | 644453 |
| 1996-97 | 132751 | 213096 | 159129 | 203714 | 708691 |
| 1997-98 | 141554 | 240978 | 175114 | 227273 | 784919 |
| 1998-99 | 151227 | 251816 | 189327 | 326678 | 919048 |
| 1999-00 | 156181 | 269020 | 189289 | 258657 | 873148 |
| 2000-01 | 163499 | 282618 | 195061 | 248162 | 889340 |
| 2001-02 | 162068 | 285529 | 201510 | 245725 | 894832 |
| 2002-03 | 167049 | 302117 | 213678 | 276246 | 959090 |
| 2003-04 | 175356 | 342315 | 238392 | 313743 | 1069806 |
| 2004-05 | 200742 | 370075 | 241970 | 334867 | 1147654 |

**Gross Value Added of Major Crops - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 852 | 2979 | 1506 | 3452 | 8790 |
| 1971-72 | 1048 | 3515 | 1610 | 4046 | 10219 |
| 1972-73 | 1124 | 3979 | 1882 | 5594 | 12580 |
| 1973-74 | 1538 | 5580 | 2612 | 6634 | 16364 |
| 1974-75 | 1545 | 6288 | 2884 | 8580 | 19298 |
| 1975-76 | 1860 | 6949 | 3501 | 9637 | 21948 |
| 1976-77 | 1825 | 7251 | 4290 | 11030 | 24396 |
| 1977-78 | 2528 | 8806 | 4892 | 11187 | 27413 |
| 1978-79 | 2530 | 9629 | 4738 | 13519 | 30416 |
| 1979-80 | 3063 | 11983 | 5139 | 14992 | 35177 |
| 1980-81 | 2729 | 13206 | 6255 | 18172 | 40362 |
| 1981-82 | 3746 | 16283 | 7767 | 19352 | 47148 |
| 1982-83 | 4177 | 17272 | 7467 | 22248 | 51164 |
| 1983-84 | 3303 | 14797 | 7680 | 20587 | 46367 |
| 1984-85 | 5749 | 19536 | 8107 | 23004 | 56396 |
| 1985-86 | 5923 | 20802 | 7760 | 27416 | 61901 |
| 1986-87 | 6334 | 22527 | 7994 | 24558 | 61412 |
| 1987-88 | 7025 | 25431 | 9030 | 27294 | 68781 |
| 1988-89 | 7142 | 28757 | 10541 | 35449 | 81888 |
| 1989-90 | 8118 | 31546 | 11307 | 37259 | 88230 |
| 1990-91 | 9293 | 37989 | 12879 | 43671 | 103831 |
| 1991-92 | 13902 | 51162 | 16401 | 53023 | 134489 |
| 1992-93 | 11702 | 44427 | 16384 | 54854 | 127368 |
| 1993-94 | 10963 | 47790 | 21267 | 70668 | 150689 |
| 1994-95 | 15037 | 65223 | 27857 | 85816 | 193933 |
| 1995-96 | 20429 | 80179 | 28583 | 91847 | 221038 |
| 1996-97 | 19890 | 86066 | 31658 | 107850 | 245464 |
| 1997-98 | 25553 | 104656 | 43639 | 126668 | 300516 |
| 1998-99 | 27107 | 108238 | 46912 | 127331 | 309588 |
| 1999-00 | 32085 | 118848 | 41603 | 149468 | 342004 |
| 2000-01 | 31113 | 123454 | 38928 | 134932 | 328426 |
| 2001-02 | 27025 | 120335 | 40212 | 125482 | 313054 |
| 2002-03 | 29170 | 132562 | 47175 | 150302 | 359209 |
| 2003-04 | 30988 | 156657 | 56112 | 172881 | 416638 |
| 2004-05 | 45715 | 180917 | 55355 | 197478 | 479464 |

**Gross Value Added of Minor Crops - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-June | Annual |
|---|---|---|---|---|---|
| 1970-71 | 2046 | 937 | 1043 | 906 | 4931 |
| 1971-72 | 2000 | 953 | 1134 | 1010 | 5097 |
| 1972-73 | 2047 | 940 | 1395 | 1288 | 5670 |
| 1973-74 | 3267 | 1857 | 2027 | 2141 | 9293 |
| 1974-75 | 4021 | 1939 | 2353 | 2067 | 10380 |
| 1975-76 | 4407 | 2389 | 2703 | 2471 | 11969 |
| 1976-77 | 4885 | 2473 | 3083 | 2694 | 13136 |
| 1977-78 | 5477 | 2702 | 3115 | 2600 | 13894 |
| 1978-79 | 5750 | 3047 | 3962 | 3419 | 16178 |
| 1979-80 | 6539 | 2979 | 3829 | 3113 | 16461 |
| 1980-81 | 6402 | 3731 | 4665 | 4386 | 19185 |
| 1981-82 | 8945 | 5239 | 6071 | 4659 | 24914 |
| 1982-83 | 9307 | 5078 | 6157 | 4919 | 25461 |
| 1983-84 | 10909 | 6778 | 7383 | 6034 | 31105 |
| 1984-85 | 12456 | 6880 | 7938 | 5949 | 33224 |
| 1985-86 | 12276 | 6512 | 7887 | 5957 | 32632 |
| 1986-87 | 12952 | 7413 | 8411 | 6542 | 35319 |
| 1987-88 | 15401 | 7499 | 9081 | 7724 | 39705 |
| 1988-89 | 18287 | 10719 | 11805 | 8571 | 49381 |
| 1989-90 | 16897 | 9718 | 10765 | 8827 | 46208 |
| 1990-91 | 20925 | 12543 | 14204 | 10694 | 58366 |
| 1991-92 | 22575 | 12474 | 14319 | 10691 | 60060 |
| 1992-93 | 24270 | 13625 | 16804 | 12001 | 66700 |
| 1993-94 | 29426 | 17757 | 21138 | 15416 | 83737 |
| 1994-95 | 32513 | 19699 | 25347 | 17564 | 95124 |
| 1995-96 | 38169 | 21593 | 23210 | 18763 | 101736 |
| 1996-97 | 41689 | 21896 | 28698 | 20393 | 112675 |
| 1997-98 | 42763 | 26012 | 28990 | 23364 | 121129 |
| 1998-99 | 49555 | 28461 | 35266 | 26363 | 139645 |
| 1999-00 | 42784 | 24939 | 33015 | 24942 | 125680 |
| 2000-01 | 47312 | 27939 | 35477 | 25357 | 136085 |
| 2001-02 | 46311 | 26963 | 33491 | 27126 | 133891 |
| 2002-03 | 46317 | 27591 | 33980 | 26455 | 134343 |
| 2003-04 | 48050 | 33817 | 41788 | 31243 | 154898 |
| 2004-05 | 57612 | 30195 | 39918 | 32430 | 160155 |

**Gross Value Added of Livestock - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 2774 | 3564 | 3445 | 2988 | 12771 |
| 1971-72 | 3079 | 4084 | 3765 | 3155 | 14084 |
| 1972-73 | 3282 | 4201 | 3974 | 3666 | 15124 |
| 1973-74 | 4095 | 5648 | 5732 | 5341 | 20816 |
| 1974-75 | 5543 | 7691 | 7547 | 6265 | 27046 |
| 1975-76 | 6461 | 8866 | 8484 | 7394 | 31205 |
| 1976-77 | 7918 | 10769 | 10087 | 8451 | 37225 |
| 1977-78 | 8654 | 11377 | 10825 | 8721 | 39577 |
| 1978-79 | 8952 | 11823 | 11148 | 9461 | 41384 |
| 1979-80 | 10326 | 13155 | 12153 | 10576 | 46210 |
| 1980-81 | 11822 | 15351 | 14526 | 12679 | 54378 |
| 1981-82 | 13454 | 17558 | 17240 | 14392 | 62644 |
| 1982-83 | 15307 | 20472 | 19453 | 16132 | 71364 |
| 1983-84 | 17209 | 22491 | 21219 | 18246 | 79166 |
| 1984-85 | 19115 | 26446 | 24008 | 19572 | 89140 |
| 1985-86 | 20553 | 28061 | 26033 | 21315 | 95962 |
| 1986-87 | 22799 | 30673 | 29568 | 24835 | 107874 |
| 1987-88 | 26344 | 35731 | 33709 | 27532 | 123316 |
| 1988-89 | 30291 | 39924 | 37448 | 31857 | 139520 |
| 1989-90 | 33851 | 43970 | 41046 | 34342 | 153209 |
| 1990-91 | 35984 | 47947 | 45885 | 38997 | 168812 |
| 1991-92 | 40235 | 54047 | 50850 | 42997 | 188129 |
| 1992-93 | 44126 | 60055 | 55988 | 47325 | 207494 |
| 1993-94 | 49618 | 68397 | 64303 | 54734 | 237052 |
| 1994-95 | 56166 | 78888 | 73622 | 60518 | 269194 |
| 1995-96 | 61729 | 88343 | 84473 | 67644 | 302188 |
| 1996-97 | 67372 | 98750 | 91516 | 69075 | 326712 |
| 1997-98 | 69656 | 104230 | 95308 | 71180 | 340375 |
| 1998-99 | 70617 | 108266 | 99432 | 166487 | 444803 |
| 1999-00 | 74654 | 115256 | 103224 | 74275 | 367409 |
| 2000-01 | 77685 | 120264 | 108224 | 77123 | 383295 |
| 2001-02 | 81332 | 126823 | 114924 | 82024 | 405103 |
| 2002-03 | 83699 | 130295 | 119268 | 87973 | 421235 |
| 2003-04 | 88638 | 140157 | 127443 | 98179 | 454416 |
| 2004-05 | 91008 | 149372 | 135690 | 94747 | 470817 |

**Gross Value Added of Fishing - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 22 | 37 | 34 | 35 | 128 |
| 1971-72 | 20 | 36 | 40 | 40 | 136 |
| 1972-73 | 14 | 35 | 49 | 44 | 142 |
| 1973-74 | 25 | 46 | 63 | 40 | 174 |
| 1974-75 | 28 | 64 | 66 | 46 | 203 |
| 1975-76 | 45 | 102 | 90 | 75 | 312 |
| 1976-77 | 58 | 116 | 110 | 107 | 390 |
| 1977-78 | 64 | 138 | 159 | 121 | 481 |
| 1978-79 | 75 | 157 | 177 | 103 | 513 |
| 1979-80 | 77 | 184 | 207 | 195 | 662 |
| 1980-81 | 138 | 283 | 334 | 234 | 990 |
| 1981-82 | 160 | 334 | 362 | 289 | 1144 |
| 1982-83 | 176 | 363 | 418 | 328 | 1285 |
| 1983-84 | 268 | 451 | 489 | 395 | 1603 |
| 1984-85 | 238 | 516 | 573 | 488 | 1816 |
| 1985-86 | 293 | 605 | 732 | 627 | 2257 |
| 1986-87 | 297 | 784 | 893 | 726 | 2700 |
| 1987-88 | 407 | 902 | 1011 | 800 | 3120 |
| 1988-89 | 468 | 1040 | 1199 | 924 | 3631 |
| 1989-90 | 561 | 1164 | 1379 | 1100 | 4205 |
| 1990-91 | 672 | 1273 | 1438 | 1224 | 4607 |
| 1991-92 | 782 | 1509 | 1658 | 1418 | 5367 |
| 1992-93 | 785 | 1723 | 1945 | 1402 | 5855 |
| 1993-94 | 803 | 1576 | 2241 | 1892 | 6512 |
| 1994-95 | 959 | 2278 | 3048 | 1912 | 8197 |
| 1995-96 | 1119 | 2765 | 3222 | 2742 | 9849 |
| 1996-97 | 1505 | 3383 | 3735 | 3146 | 11769 |
| 1997-98 | 1608 | 3516 | 4243 | 3415 | 12781 |
| 1998-99 | 1879 | 4160 | 4661 | 3769 | 14470 |
| 1999-00 | 2005 | 4038 | 4638 | 3928 | 14608 |
| 2000-01 | 2162 | 4235 | 4783 | 3910 | 15091 |
| 2001-02 | 2244 | 4834 | 5438 | 4515 | 17030 |
| 2002-03 | 2151 | 4227 | 4702 | 3774 | 14854 |
| 2003-04 | 2167 | 4343 | 4482 | 3494 | 14486 |
| 2004-05 | 1938 | 3840 | 4524 | 4132 | 14434 |

**Gross Value Added of Forestry - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 41 | 59 | 74 | 73 | 248 |
| 1971-72 | 68 | 75 | 113 | 110 | 366 |
| 1972-73 | 128 | 160 | 182 | 152 | 622 |
| 1973-74 | 122 | 209 | 344 | 315 | 990 |
| 1974-75 | 148 | 187 | 239 | 195 | 769 |
| 1975-76 | 70 | 88 | 102 | 91 | 351 |
| 1976-77 | 125 | 157 | 174 | 160 | 616 |
| 1977-78 | 184 | 300 | 339 | 301 | 1123 |
| 1978-79 | 377 | 493 | 645 | 595 | 2111 |
| 1979-80 | 409 | 545 | 627 | 585 | 2165 |
| 1980-81 | 506 | 674 | 753 | 804 | 2737 |
| 1981-82 | 679 | 871 | 1005 | 891 | 3446 |
| 1982-83 | 760 | 994 | 1128 | 998 | 3881 |
| 1983-84 | 839 | 1115 | 1302 | 1146 | 4402 |
| 1984-85 | 927 | 1182 | 1387 | 1225 | 4721 |
| 1985-86 | 990 | 1281 | 1450 | 1248 | 4969 |
| 1986-87 | 1054 | 1384 | 1578 | 1379 | 5395 |
| 1987-88 | 1125 | 1474 | 1721 | 1507 | 5826 |
| 1988-89 | 1270 | 1671 | 1961 | 1759 | 6661 |
| 1989-90 | 1748 | 2266 | 2609 | 2363 | 8986 |
| 1990-91 | 1972 | 2663 | 3161 | 2790 | 10586 |
| 1991-92 | 1694 | 2217 | 2574 | 2349 | 8835 |
| 1992-93 | 1863 | 2451 | 2815 | 2440 | 9569 |
| 1993-94 | 2148 | 2760 | 3195 | 2869 | 10971 |
| 1994-95 | 2309 | 2971 | 3466 | 3109 | 11856 |
| 1995-96 | 1862 | 2444 | 2828 | 2508 | 9643 |
| 1996-97 | 2295 | 3002 | 3522 | 3251 | 12069 |
| 1997-98 | 1974 | 2564 | 2933 | 2647 | 10118 |
| 1998-99 | 2069 | 2690 | 3057 | 2727 | 10543 |
| 1999-00 | 4653 | 5940 | 6809 | 6044 | 23447 |
| 2000-01 | 5227 | 6727 | 7649 | 6840 | 26443 |
| 2001-02 | 5157 | 6574 | 7446 | 6578 | 25754 |
| 2002-03 | 5711 | 7441 | 8553 | 7742 | 29448 |
| 2003-04 | 5513 | 7342 | 8567 | 7946 | 29368 |
| 2004-05 | 4470 | 5751 | 6484 | 6080 | 22784 |

**Gross Value Added of Industry**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 3221 | 3689 | 3947 | 3632 | 14488 |
| 1971-72 | 3573 | 4018 | 4160 | 3769 | 15520 |
| 1972-73 | 4234 | 4829 | 5295 | 4908 | 19266 |
| 1973-74 | 5225 | 6278 | 7003 | 7047 | 25553 |
| 1974-75 | 7910 | 9231 | 9641 | 9137 | 35919 |
| 1975-76 | 9417 | 10430 | 11483 | 10520 | 41850 |
| 1976-77 | 10596 | 11848 | 13255 | 11904 | 47603 |
| 1977-78 | 11978 | 12301 | 13248 | 11564 | 49092 |
| 1978-79 | 12853 | 13358 | 14946 | 13501 | 54657 |
| 1979-80 | 14901 | 16302 | 18442 | 17334 | 66979 |
| 1980-81 | 17843 | 20345 | 21816 | 19562 | 79566 |
| 1981-82 | 21229 | 23381 | 25099 | 22550 | 92258 |
| 1982-83 | 23471 | 26337 | 28625 | 26182 | 104615 |
| 1983-84 | 27563 | 30062 | 37295 | 30031 | 124951 |
| 1984-85 | 31895 | 35078 | 38060 | 34876 | 139908 |
| 1985-86 | 36615 | 41124 | 42028 | 37832 | 157599 |
| 1986-87 | 40055 | 43756 | 48109 | 43722 | 175642 |
| 1987-88 | 45655 | 51497 | 57525 | 50278 | 204954 |
| 1988-89 | 53096 | 55996 | 64051 | 58816 | 231959 |
| 1989-90 | 59641 | 66995 | 69328 | 63034 | 258998 |
| 1990-91 | 69641 | 77026 | 85678 | 78462 | 310807 |
| 1991-92 | 80931 | 88813 | 98536 | 87583 | 355863 |
| 1992-93 | 84141 | 96071 | 107893 | 95749 | 383853 |
| 1993-94 | 93490 | 106807 | 124101 | 116409 | 440808 |
| 1994-95 | 113277 | 126506 | 147980 | 131629 | 519392 |
| 1995-96 | 126284 | 149359 | 166497 | 153826 | 595967 |
| 1996-97 | 148081 | 169450 | 187452 | 164184 | 669167 |
| 1997-98 | 161738 | 181510 | 203512 | 179187 | 725947 |
| 1998-99 | 181305 | 201431 | 219128 | 274476 | 876338 |
| 1999-00 | 187986 | 220030 | 228593 | 213604 | 850213 |
| 2000-01 | 211110 | 233731 | 263766 | 242500 | 951107 |
| 2001-02 | 233591 | 238987 | 269386 | 256846 | 998810 |
| 2002-03 | 240023 | 263701 | 315414 | 287778 | 1106916 |
| 2003-04 | 297208 | 340167 | 399285 | 374468 | 1411129 |
| 2004-05 | 371808 | 404596 | 463649 | 427213 | 1667266 |

**Gross Value Added of Mining & Quarrying - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 65 | 63 | 68 | 71 | 267 |
| 1971-72 | 68 | 67 | 71 | 73 | 280 |
| 1972-73 | 96 | 98 | 114 | 111 | 418 |
| 1973-74 | 106 | 109 | 130 | 148 | 493 |
| 1974-75 | 133 | 140 | 199 | 229 | 700 |
| 1975-76 | 203 | 219 | 228 | 273 | 923 |
| 1976-77 | 299 | 327 | 339 | 333 | 1299 |
| 1977-78 | 326 | 328 | 324 | 313 | 1291 |
| 1978-79 | 266 | 311 | 350 | 355 | 1281 |
| 1979-80 | 372 | 392 | 500 | 486 | 1750 |
| 1980-81 | 511 | 595 | 613 | 558 | 2278 |
| 1981-82 | 532 | 607 | 714 | 747 | 2600 |
| 1982-83 | 687 | 727 | 882 | 902 | 3198 |
| 1983-84 | 862 | 967 | 975 | 1083 | 3887 |
| 1984-85 | 1206 | 1436 | 1468 | 1718 | 5829 |
| 1985-86 | 2471 | 2376 | 2478 | 2526 | 9850 |
| 1986-87 | 2766 | 3012 | 2999 | 3004 | 11780 |
| 1987-88 | 3602 | 3835 | 4218 | 3830 | 15485 |
| 1988-89 | 3566 | 3696 | 4024 | 4227 | 15513 |
| 1989-90 | 3957 | 4351 | 4326 | 4532 | 17167 |
| 1990-91 | 4591 | 5126 | 5193 | 5514 | 20425 |
| 1991-92 | 5196 | 5400 | 5526 | 5391 | 21512 |
| 1992-93 | 4955 | 5476 | 5694 | 5464 | 21589 |
| 1993-94 | 5699 | 5920 | 6084 | 5768 | 23471 |
| 1994-95 | 5409 | 6238 | 6445 | 6719 | 24810 |
| 1995-96 | 6980 | 7782 | 8027 | 7847 | 30636 |
| 1996-97 | 7377 | 8287 | 10145 | 9895 | 35704 |
| 1997-98 | 9499 | 9954 | 9935 | 10037 | 39426 |
| 1998-99 | 9654 | 9836 | 9967 | 9572 | 39029 |
| 1999-00 | 10653 | 12516 | 12870 | 12277 | 48315 |
| 2000-01 | 13978 | 14980 | 13782 | 17709 | 60448 |
| 2001-02 | 15574 | 16301 | 16407 | 17997 | 66279 |
| 2002-03 | 20424 | 21014 | 21215 | 21163 | 83816 |
| 2003-04 | 27735 | 28895 | 27661 | 30581 | 114871 |
| 2004-05 | 22073 | 23009 | 23442 | 25871 | 94396 |

**Gross Value Added of Large-scale Manufacturing - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 2110 | 2455 | 2598 | 2349 | 9513 |
| 1971-72 | 2341 | 2647 | 2757 | 2437 | 10182 |
| 1972-73 | 2732 | 3189 | 3491 | 3135 | 12548 |
| 1973-74 | 3265 | 4177 | 4479 | 4370 | 16290 |
| 1974-75 | 4996 | 5846 | 5824 | 5554 | 22220 |
| 1975-76 | 5472 | 6310 | 6730 | 6040 | 24552 |
| 1976-77 | 5927 | 6908 | 7232 | 6426 | 26492 |
| 1977-78 | 6739 | 6755 | 6930 | 6025 | 26448 |
| 1978-79 | 7117 | 7470 | 7774 | 6913 | 29275 |
| 1979-80 | 7824 | 9114 | 9658 | 8896 | 35492 |
| 1980-81 | 9792 | 11535 | 11752 | 10483 | 43562 |
| 1981-82 | 11829 | 13494 | 13694 | 12217 | 51235 |
| 1982-83 | 13126 | 15404 | 15968 | 14436 | 58934 |
| 1983-84 | 15307 | 17511 | 21834 | 16288 | 70940 |
| 1984-85 | 17682 | 20426 | 21095 | 19129 | 78332 |
| 1985-86 | 19277 | 23094 | 21841 | 19343 | 83554 |
| 1986-87 | 20929 | 23467 | 24816 | 22052 | 91264 |
| 1987-88 | 23030 | 26655 | 29277 | 24732 | 103694 |
| 1988-89 | 26255 | 27467 | 31472 | 28418 | 113613 |
| 1989-90 | 29318 | 33705 | 31804 | 29018 | 123845 |
| 1990-91 | 33279 | 36666 | 39474 | 35986 | 145405 |
| 1991-92 | 38074 | 42333 | 45170 | 40420 | 165997 |
| 1992-93 | 38032 | 44738 | 48045 | 42135 | 172950 |
| 1993-94 | 40038 | 45814 | 52224 | 51803 | 189879 |
| 1994-95 | 48209 | 54972 | 61409 | 56353 | 220942 |
| 1995-96 | 54284 | 67852 | 72990 | 68177 | 263302 |
| 1996-97 | 64158 | 73256 | 77545 | 67777 | 282736 |
| 1997-98 | 66398 | 75860 | 83680 | 73702 | 299641 |
| 1998-99 | 70249 | 79188 | 88744 | 79233 | 317414 |
| 1999-00 | 75355 | 89101 | 89230 | 84916 | 338602 |
| 2000-01 | 91282 | 100976 | 114603 | 104018 | 410879 |
| 2001-02 | 98531 | 100442 | 115160 | 109956 | 424089 |
| 2002-03 | 104516 | 113043 | 138120 | 125695 | 481374 |
| 2003-04 | 126561 | 149124 | 179671 | 166544 | 621899 |
| 2004-05 | 175400 | 189656 | 218342 | 201702 | 785100 |

**Gross Value Added of Small-scale Manufacturing - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 331 | 361 | 373 | 362 | 1427 |
| 1971-72 | 396 | 419 | 427 | 405 | 1647 |
| 1972-73 | 454 | 496 | 532 | 512 | 1994 |
| 1973-74 | 549 | 658 | 690 | 722 | 2619 |
| 1974-75 | 915 | 1003 | 977 | 1000 | 3894 |
| 1975-76 | 1082 | 1168 | 1220 | 1174 | 4644 |
| 1976-77 | 1286 | 1404 | 1439 | 1371 | 5501 |
| 1977-78 | 1439 | 1351 | 1357 | 1265 | 5412 |
| 1978-79 | 1600 | 1576 | 1603 | 1526 | 6304 |
| 1979-80 | 1722 | 1880 | 1944 | 1927 | 7473 |
| 1980-81 | 2079 | 2288 | 2294 | 2188 | 8849 |
| 1981-82 | 2387 | 2548 | 2538 | 2429 | 9901 |
| 1982-83 | 2656 | 2922 | 2960 | 2867 | 11405 |
| 1983-84 | 3287 | 3561 | 4292 | 3420 | 14560 |
| 1984-85 | 3644 | 3915 | 3916 | 3914 | 15389 |
| 1985-86 | 4207 | 4646 | 4513 | 4117 | 17484 |
| 1986-87 | 4836 | 5112 | 5240 | 5083 | 20271 |
| 1987-88 | 5515 | 6041 | 6346 | 5701 | 23603 |
| 1988-89 | 6613 | 6918 | 7255 | 6875 | 27661 |
| 1989-90 | 7598 | 8375 | 8242 | 7520 | 31735 |
| 1990-91 | 9002 | 9919 | 10678 | 9735 | 39334 |
| 1991-92 | 10408 | 11572 | 12348 | 11049 | 45378 |
| 1992-93 | 10886 | 12806 | 13752 | 12060 | 49504 |
| 1993-94 | 12170 | 13926 | 15875 | 15747 | 57717 |
| 1994-95 | 15182 | 17312 | 19340 | 17747 | 69582 |
| 1995-96 | 17125 | 21406 | 23026 | 21508 | 83065 |
| 1996-97 | 22477 | 25664 | 27167 | 23745 | 99052 |
| 1997-98 | 23685 | 27061 | 29850 | 26291 | 106887 |
| 1998-99 | 26060 | 29375 | 32920 | 29392 | 117747 |
| 1999-00 | 29458 | 34832 | 34883 | 33196 | 132369 |
| 2000-01 | 31872 | 35257 | 40015 | 36319 | 143463 |
| 2001-02 | 37577 | 38306 | 43918 | 41934 | 161734 |
| 2002-03 | 37792 | 40875 | 49943 | 45450 | 174061 |
| 2003-04 | 40829 | 48107 | 57962 | 53727 | 200625 |
| 2004-05 | 49636 | 53671 | 61789 | 57080 | 222176 |

**Gross Value Added of Slaughtering - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 167 | 238 | 341 | 219 | 965 |
| 1971-72 | 207 | 308 | 408 | 253 | 1176 |
| 1972-73 | 239 | 326 | 460 | 317 | 1342 |
| 1973-74 | 325 | 456 | 749 | 549 | 2080 |
| 1974-75 | 497 | 767 | 1147 | 693 | 3103 |
| 1975-76 | 648 | 984 | 1385 | 902 | 3919 |
| 1976-77 | 936 | 1365 | 1939 | 1254 | 5494 |
| 1977-78 | 1061 | 1469 | 2126 | 1308 | 5964 |
| 1978-79 | 1093 | 1582 | 2303 | 1455 | 6433 |
| 1979-80 | 1330 | 1851 | 2606 | 1753 | 7540 |
| 1980-81 | 1615 | 2313 | 3251 | 2097 | 9276 |
| 1981-82 | 1850 | 2667 | 3749 | 2366 | 10632 |
| 1982-83 | 2109 | 3013 | 4263 | 2694 | 12080 |
| 1983-84 | 2446 | 3412 | 4796 | 3086 | 13739 |
| 1984-85 | 2758 | 3937 | 5595 | 3542 | 15832 |
| 1985-86 | 3072 | 4321 | 6156 | 3994 | 17542 |
| 1986-87 | 3238 | 4561 | 6664 | 4360 | 18824 |
| 1987-88 | 4040 | 5698 | 8272 | 5321 | 23330 |
| 1988-89 | 5234 | 7505 | 10773 | 6844 | 30356 |
| 1989-90 | 6257 | 8759 | 12326 | 7828 | 35170 |
| 1990-91 | 7182 | 10129 | 14525 | 9523 | 41360 |
| 1991-92 | 8702 | 12124 | 17336 | 11433 | 49594 |
| 1992-93 | 10435 | 14471 | 20385 | 13590 | 58881 |
| 1993-94 | 12929 | 17942 | 25531 | 17737 | 74140 |
| 1994-95 | 15997 | 22772 | 32443 | 21646 | 92858 |
| 1995-96 | 13782 | 19350 | 27938 | 18461 | 79531 |
| 1996-97 | 16014 | 22643 | 32203 | 20407 | 91267 |
| 1997-98 | 17018 | 23688 | 33787 | 21476 | 95969 |
| 1998-99 | 20915 | 28059 | 38341 | 104909 | 192224 |
| 1999-00 | 18642 | 25962 | 36358 | 22948 | 103910 |
| 2000-01 | 19582 | 27181 | 38118 | 24027 | 108908 |
| 2001-02 | 20535 | 28557 | 41093 | 25952 | 116137 |
| 2002-03 | 24382 | 34326 | 50892 | 34062 | 143661 |
| 2003-04 | 27493 | 39285 | 58493 | 41331 | 166603 |
| 2004-05 | 35529 | 50244 | 71692 | 46616 | 204081 |

**Gross Value Added of Construction - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Feb | Mar-Apr | Annual |
|---|---|---|---|---|---|
| 1970-71 | 414 | 421 | 419 | 423 | 1677 |
| 1971-72 | 406 | 399 | 327 | 362 | 1494 |
| 1972-73 | 519 | 483 | 454 | 492 | 1947 |
| 1973-74 | 704 | 550 | 611 | 779 | 2644 |
| 1974-75 | 1023 | 1071 | 1084 | 1075 | 4253 |
| 1975-76 | 1551 | 1231 | 1433 | 1466 | 5681 |
| 1976-77 | 1612 | 1247 | 1738 | 1760 | 6358 |
| 1977-78 | 1829 | 1762 | 1907 | 1856 | 7354 |
| 1978-79 | 2123 | 1683 | 2185 | 2289 | 8279 |
| 1979-80 | 2746 | 2109 | 2611 | 2805 | 10271 |
| 1980-81 | 2422 | 2063 | 2394 | 2412 | 9290 |
| 1981-82 | 3136 | 2473 | 2873 | 2880 | 11362 |
| 1982-83 | 3237 | 2540 | 2815 | 3101 | 11692 |
| 1983-84 | 3655 | 2526 | 3420 | 3637 | 13237 |
| 1984-85 | 4398 | 3080 | 4003 | 3820 | 15301 |
| 1985-86 | 4690 | 3722 | 4228 | 4441 | 17081 |
| 1986-87 | 5200 | 4308 | 5245 | 5363 | 20117 |
| 1987-88 | 5506 | 5240 | 5597 | 6029 | 22373 |
| 1988-89 | 6795 | 5631 | 6004 | 6904 | 25334 |
| 1989-90 | 7043 | 6216 | 7325 | 7427 | 28012 |
| 1990-91 | 9012 | 7935 | 8720 | 9116 | 34783 |
| 1991-92 | 10363 | 9119 | 10288 | 9867 | 39637 |
| 1992-93 | 11082 | 9735 | 11505 | 12131 | 44453 |
| 1993-94 | 12008 | 11811 | 13493 | 12124 | 49436 |
| 1994-95 | 15073 | 11352 | 14618 | 13431 | 54474 |
| 1995-96 | 16419 | 14434 | 16770 | 16020 | 63643 |
| 1996-97 | 19122 | 18615 | 18688 | 16528 | 72954 |
| 1997-98 | 19998 | 19819 | 22344 | 17814 | 79975 |
| 1998-99 | 22269 | 23053 | 18762 | 15112 | 79196 |
| 1999-00 | 21001 | 24343 | 22257 | 19790 | 87390 |
| 2000-01 | 23802 | 22103 | 25637 | 23327 | 94870 |
| 2001-02 | 26858 | 23623 | 22311 | 23027 | 95818 |
| 2002-03 | 23442 | 24319 | 25114 | 28748 | 101624 |
| 2003-04 | 28116 | 27873 | 29953 | 29312 | 115254 |
| 2004-05 | 38236 | 37891 | 39345 | 39100 | 154572 |

**Gross Value Added of Electricity, Gas & Water Supply - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 134 | 152 | 147 | 206 | 639 |
| 1971-72 | 156 | 178 | 170 | 239 | 742 |
| 1972-73 | 194 | 236 | 245 | 341 | 1016 |
| 1973-74 | 276 | 328 | 344 | 479 | 1427 |
| 1974-75 | 346 | 405 | 410 | 588 | 1749 |
| 1975-76 | 460 | 518 | 487 | 666 | 2131 |
| 1976-77 | 536 | 597 | 568 | 759 | 2460 |
| 1977-78 | 585 | 636 | 603 | 798 | 2622 |
| 1978-79 | 655 | 736 | 730 | 963 | 3084 |
| 1979-80 | 907 | 957 | 1122 | 1467 | 4453 |
| 1980-81 | 1424 | 1550 | 1512 | 1825 | 6311 |
| 1981-82 | 1496 | 1592 | 1531 | 1910 | 6528 |
| 1982-83 | 1656 | 1731 | 1736 | 2182 | 7305 |
| 1983-84 | 2006 | 2085 | 1979 | 2518 | 8588 |
| 1984-85 | 2206 | 2283 | 1984 | 2752 | 9225 |
| 1985-86 | 2899 | 2966 | 2812 | 3411 | 12089 |
| 1986-87 | 3087 | 3296 | 3145 | 3860 | 13387 |
| 1987-88 | 3962 | 4028 | 3815 | 4665 | 16470 |
| 1988-89 | 4632 | 4779 | 4523 | 5548 | 19482 |
| 1989-90 | 5468 | 5589 | 5305 | 6709 | 23070 |
| 1990-91 | 6574 | 7252 | 7087 | 8588 | 29500 |
| 1991-92 | 8188 | 8265 | 7869 | 9422 | 33744 |
| 1992-93 | 8750 | 8845 | 8511 | 10370 | 36476 |
| 1993-94 | 10647 | 11393 | 10894 | 13229 | 46163 |
| 1994-95 | 13408 | 13859 | 13726 | 15732 | 56725 |
| 1995-96 | 17693 | 18536 | 17746 | 21814 | 75789 |
| 1996-97 | 18933 | 20984 | 21703 | 25833 | 87454 |
| 1997-98 | 25138 | 25128 | 23915 | 29867 | 104049 |
| 1998-99 | 32158 | 31921 | 30393 | 36257 | 130729 |
| 1999-00 | 32877 | 33276 | 32996 | 40478 | 139627 |
| 2000-01 | 30593 | 33234 | 31612 | 37101 | 132540 |
| 2001-02 | 34516 | 31757 | 30498 | 37981 | 134753 |
| 2002-03 | 29466 | 30124 | 30130 | 32660 | 122380 |
| 2003-04 | 46474 | 46883 | 45545 | 52974 | 191876 |
| 2004-05 | 50934 | 50125 | 49039 | 56843 | 206941 |

**Gross Value Added of Services**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 5080 | 5910 | 5817 | 5950 | 22758 |
| 1971-72 | 5661 | 6590 | 6527 | 6787 | 25564 |
| 1972-73 | 7145 | 7761 | 8175 | 8500 | 31581 |
| 1973-74 | 9370 | 11494 | 10203 | 12313 | 43380 |
| 1974-75 | 11080 | 15263 | 15437 | 16536 | 58316 |
| 1975-76 | 14823 | 17270 | 17346 | 16912 | 66351 |
| 1976-77 | 17333 | 19679 | 19549 | 19349 | 75909 |
| 1977-78 | 19466 | 23189 | 22393 | 23679 | 88727 |
| 1978-79 | 21970 | 25184 | 26303 | 27003 | 100460 |
| 1979-80 | 25703 | 31866 | 32219 | 33561 | 123348 |
| 1980-81 | 31431 | 35878 | 37079 | 38468 | 142857 |
| 1981-82 | 36127 | 44067 | 43871 | 43102 | 167166 |
| 1982-83 | 43432 | 47184 | 49996 | 49205 | 189817 |
| 1983-84 | 49712 | 56131 | 59087 | 55860 | 220791 |
| 1984-85 | 54351 | 63447 | 67264 | 63849 | 248912 |
| 1985-86 | 65124 | 69841 | 73907 | 71931 | 280803 |
| 1986-87 | 70620 | 78221 | 81534 | 80796 | 311171 |
| 1987-88 | 80199 | 88353 | 94813 | 91202 | 354566 |
| 1988-89 | 90841 | 99927 | 108037 | 103650 | 402455 |
| 1989-90 | 101803 | 112996 | 117189 | 116179 | 448166 |
| 1990-91 | 119824 | 134785 | 141197 | 139712 | 535518 |
| 1991-92 | 141044 | 156792 | 162816 | 162351 | 623003 |
| 1992-93 | 169786 | 174234 | 186358 | 184271 | 714650 |
| 1993-94 | 181389 | 202147 | 219027 | 221057 | 823620 |
| 1994-95 | 216055 | 244499 | 268695 | 256694 | 985943 |
| 1995-96 | 248998 | 276886 | 300355 | 294659 | 1120897 |
| 1996-97 | 285684 | 323649 | 344528 | 342050 | 1295912 |
| 1997-98 | 326853 | 363914 | 379010 | 370304 | 1440081 |
| 1998-99 | 358406 | 414683 | 399946 | 422172 | 1595208 |
| 1999-00 | 389358 | 457528 | 450611 | 496115 | 1793612 |
| 2000-01 | 458111 | 518252 | 523074 | 535080 | 2034516 |
| 2001-02 | 499907 | 551748 | 549798 | 584974 | 2186427 |
| 2002-03 | 534611 | 604632 | 618612 | 635526 | 2393381 |
| 2003-04 | 599105 | 705423 | 695337 | 684225 | 2684090 |
| 2004-05 | 726673 | 875790 | 842112 | 768175 | 3212750 |

**Gross Value Added of Wholesale & Retail Trade, and Hotels & Restaurants**
**Quarterly** (at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 1967 | 2364 | 2483 | 2360 | 9173 |
| 1971-72 | 2186 | 2642 | 2852 | 2848 | 10529 |
| 1972-73 | 2795 | 3347 | 3795 | 3900 | 13836 |
| 1973-74 | 3734 | 4714 | 5071 | 5205 | 18724 |
| 1974-75 | 4796 | 5972 | 6549 | 6651 | 23968 |
| 1975-76 | 5683 | 6701 | 7014 | 7033 | 26430 |
| 1976-77 | 6102 | 7502 | 8223 | 7920 | 29748 |
| 1977-78 | 6988 | 8228 | 8996 | 8617 | 32829 |
| 1978-79 | 7579 | 9377 | 10440 | 10206 | 37602 |
| 1979-80 | 9329 | 10827 | 12018 | 12245 | 44419 |
| 1980-81 | 11072 | 13625 | 14605 | 14859 | 54161 |
| 1981-82 | 13670 | 16790 | 17530 | 17128 | 65117 |
| 1982-83 | 15403 | 18672 | 19394 | 18945 | 72415 |
| 1983-84 | 16794 | 20561 | 22700 | 21864 | 81919 |
| 1984-85 | 20542 | 23750 | 24746 | 24743 | 93781 |
| 1985-86 | 22711 | 26951 | 27499 | 26760 | 103922 |
| 1986-87 | 23730 | 29320 | 30333 | 29910 | 113292 |
| 1987-88 | 27513 | 34025 | 36158 | 34178 | 131875 |
| 1988-89 | 30317 | 38203 | 41227 | 40160 | 149908 |
| 1989-90 | 34802 | 43627 | 44585 | 43230 | 166244 |
| 1990-91 | 38392 | 50574 | 52173 | 49985 | 191124 |
| 1991-92 | 46971 | 58671 | 60180 | 57429 | 223251 |
| 1992-93 | 50355 | 64002 | 67040 | 63918 | 245315 |
| 1993-94 | 57487 | 70736 | 78969 | 77910 | 285103 |
| 1994-95 | 69252 | 87650 | 96570 | 93997 | 347469 |
| 1995-96 | 80829 | 105473 | 110804 | 110108 | 407215 |
| 1996-97 | 95002 | 122995 | 127821 | 122847 | 468667 |
| 1997-98 | 104327 | 131725 | 137379 | 133269 | 506700 |
| 1998-99 | 113728 | 145348 | 152719 | 146862 | 558657 |
| 1999-00 | 125547 | 157723 | 162521 | 161982 | 607773 |
| 2000-01 | 141798 | 175378 | 186891 | 179882 | 683949 |
| 2001-02 | 156881 | 175903 | 189500 | 189568 | 711851 |
| 2002-03 | 158525 | 194884 | 219742 | 203548 | 776699 |
| 2003-04 | 176028 | 223429 | 248989 | 249239 | 897686 |
| 2004-05 | 218478 | 276085 | 309268 | 303900 | 1107731 |

**Gross Value Added of Transport, Storage and Communication – Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| | 680 | 707 | 737 | 768 | 2893 |
| 1971-72 | 770 | 800 | 834 | 869 | 3274 |
| 1972-73 | 918 | 959 | 991 | 1011 | 3880 |
| 1973-74 | 1223 | 1244 | 1288 | 1355 | 5110 |
| 1974-75 | 1651 | 1715 | 1801 | 1904 | 7071 |
| 1975-76 | 2071 | 2184 | 2285 | 2367 | 8907 |
| 1976-77 | 2448 | 2530 | 2649 | 2800 | 10428 |
| 1977-78 | 2903 | 3048 | 3201 | 3355 | 12507 |
| 1978-79 | 3490 | 3644 | 3828 | 4036 | 14998 |
| 1979-80 | 4331 | 4564 | 4763 | 4915 | 18573 |
| 1980-81 | 5309 | 5498 | 5693 | 5881 | 22380 |
| 1981-82 | 5891 | 6066 | 6299 | 6580 | 24835 |
| 1982-83 | 6850 | 7092 | 7437 | 7877 | 29256 |
| 1983-84 | 8710 | 9171 | 9624 | 10045 | 37550 |
| 1984-85 | 10251 | 10692 | 11178 | 11686 | 43806 |
| 1985-86 | 12621 | 13184 | 13734 | 14239 | 53778 |
| 1986-87 | 14352 | 14844 | 15475 | 16216 | 60887 |
| 1987-88 | 16173 | 16893 | 17611 | 18284 | 68961 |
| 1988-89 | 18052 | 18759 | 19466 | 20126 | 76403 |
| 1989-90 | 19901 | 20555 | 21313 | 22130 | 83899 |
| 1990-91 | 26156 | 27181 | 28065 | 28731 | 110133 |
| 1991-92 | 30223 | 30660 | 31390 | 32458 | 124730 |
| 1992-93 | 33646 | 34607 | 36115 | 37352 | 141719 |
| 1993-94 | 39396 | 42823 | 44075 | 45493 | 171787 |
| 1994-95 | 47259 | 48530 | 49442 | 50048 | 195279 |
| 1995-96 | 50666 | 51978 | 56171 | 59470 | 218286 |
| 1996-97 | 62575 | 66635 | 72013 | 73670 | 274893 |
| 1997-98 | 75078 | 77018 | 78139 | 78539 | 308774 |
| 1998-99 | 82527 | 83707 | 85124 | 90483 | 341841 |
| 1999-00 | 94200 | 97008 | 100514 | 109259 | 400981 |
| 2000-01 | 122418 | 126982 | 130933 | 133919 | 514251 |
| 2001-02 | 131275 | 134259 | 138281 | 143084 | 546899 |
| 2002-03 | 146528 | 151112 | 156121 | 161212 | 614973 |
| 2003-04 | 174274 | 196681 | 177825 | 131112 | 679892 |
| 2004-05 | 200929 | 226863 | 212811 | 161173 | 801776 |

**Gross Value Added of Finance and Insurance - Quarterly**

(at current prices) (Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 465 | 827 | 515 | 684 | 2491 |
| 1971-72 | 527 | 921 | 536 | 703 | 2685 |
| 1972-73 | 869 | 835 | 676 | 803 | 3182 |
| 1973-74 | 742 | 1785 | -81 | 1622 | 4068 |
| 1974-75 | -419 | 2255 | 1400 | 1967 | 5204 |
| 1975-76 | 1031 | 2170 | 1647 | 957 | 5806 |
| 1976-77 | 2000 | 2578 | 1157 | 978 | 6712 |
| 1977-78 | 1478 | 3623 | 1532 | 2870 | 9503 |
| 1978-79 | 1644 | 2731 | 2189 | 2534 | 9099 |
| 1979-80 | 914 | 5200 | 3638 | 4245 | 13998 |
| 1980-81 | 1762 | 3122 | 2508 | 2994 | 10386 |
| 1981-82 | 1196 | 5507 | 3779 | 2809 | 13292 |
| 1982-83 | 3972 | 3796 | 4892 | 3558 | 16219 |
| 1983-84 | 4696 | 6077 | 5841 | 2593 | 19207 |
| 1984-85 | 1821 | 6716 | 8099 | 3623 | 20259 |
| 1985-86 | 5550 | 5000 | 7066 | 4852 | 22468 |
| 1986-87 | 5981 | 6711 | 7609 | 5760 | 26061 |
| 1987-88 | 6994 | 7225 | 9778 | 6215 | 30212 |
| 1988-89 | 8070 | 7650 | 10775 | 5774 | 32269 |
| 1989-90 | 9004 | 9799 | 10826 | 8782 | 38412 |
| 1990-91 | 11098 | 11267 | 13025 | 11047 | 46438 |
| 1991-92 | 12345 | 14343 | 15571 | 14508 | 56766 |
| 1992-93 | 26125 | 14365 | 19324 | 16614 | 76427 |
| 1993-94 | 16159 | 17770 | 21789 | 20299 | 76018 |
| 1994-95 | 19276 | 24094 | 33855 | 21919 | 99145 |
| 1995-96 | 23733 | 22897 | 32186 | 20435 | 99251 |
| 1996-97 | 20563 | 21741 | 25217 | 22026 | 89547 |
| 1997-98 | 22191 | 26462 | 29687 | 20515 | 98856 |
| 1998-99 | 21343 | 41698 | 13403 | 33486 | 109930 |
| 1999-00 | 12835 | 42239 | 21897 | 55481 | 132453 |
| 2000-01 | 20588 | 38584 | 23305 | 36601 | 119078 |
| 2001-02 | 22251 | 48757 | 23104 | 49392 | 143505 |
| 2002-03 | 20389 | 46629 | 24799 | 50410 | 142228 |
| 2003-04 | 25085 | 53945 | 28987 | 56045 | 164062 |
| 2004-05 | 34857 | 76938 | 39532 | 80339 | 231666 |

**Gross Value Added of Ownership of Dwelling - Quarterly**
(current prices)

(Rs Million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 492 | 510 | 530 | 551 | 2083 |
| 1971-72 | 542 | 563 | 584 | 607 | 2296 |
| 1972-73 | 626 | 650 | 675 | 701 | 2652 |
| 1973-74 | 857 | 889 | 924 | 960 | 3629 |
| 1974-75 | 1143 | 1187 | 1233 | 1281 | 4844 |
| 1975-76 | 1344 | 1396 | 1450 | 1506 | 5695 |
| 1976-77 | 1546 | 1605 | 1668 | 1732 | 6551 |
| 1977-78 | 1741 | 1807 | 1877 | 1950 | 7375 |
| 1978-79 | 1986 | 2062 | 2142 | 2225 | 8414 |
| 1979-80 | 2309 | 2397 | 2490 | 2587 | 9782 |
| 1980-81 | 2768 | 2874 | 2986 | 3101 | 11729 |
| 1981-82 | 3085 | 3203 | 3328 | 3457 | 13073 |
| 1982-83 | 3406 | 3537 | 3674 | 3816 | 14433 |
| 1983-84 | 3750 | 3894 | 4045 | 4202 | 15890 |
| 1984-85 | 4109 | 4266 | 4431 | 4603 | 17409 |
| 1985-86 | 4491 | 4663 | 4844 | 5032 | 19031 |
| 1986-87 | 4886 | 5073 | 5270 | 5475 | 20705 |
| 1987-88 | 5309 | 5511 | 5725 | 5946 | 22491 |
| 1988-89 | 5780 | 6002 | 6236 | 6478 | 24496 |
| 1989-90 | 6526 | 6776 | 7040 | 7313 | 27655 |
| 1990-91 | 7592 | 7879 | 8182 | 8497 | 32150 |
| 1991-92 | 8738 | 9075 | 9435 | 9809 | 37057 |
| 1992-93 | 10169 | 10563 | 10973 | 11390 | 43095 |
| 1993-94 | 11797 | 12225 | 12675 | 13154 | 49851 |
| 1994-95 | 13703 | 14225 | 14753 | 15293 | 57974 |
| 1995-96 | 15828 | 16374 | 16971 | 17604 | 66776 |
| 1996-97 | 18277 | 18987 | 19734 | 20485 | 77482 |
| 1997-98 | 21247 | 21992 | 22704 | 23542 | 89485 |
| 1998-99 | 24235 | 24807 | 25446 | 26074 | 100562 |
| 1999-00 | 26670 | 27297 | 27943 | 28515 | 110425 |
| 2000-01 | 30643 | 31281 | 31854 | 32478 | 126256 |
| 2001-02 | 31911 | 32421 | 32937 | 33422 | 130690 |
| 2002-03 | 34832 | 35327 | 35835 | 36521 | 142515 |
| 2003-04 | 37388 | 38437 | 39760 | 41426 | 157011 |
| 2004-05 | 47815 | 52572 | 47628 | 32766 | 180782 |

**Gross Value Added of Public Administration & Defence - Quarterly**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 599 | 604 | 638 | 647 | 2488 |
| 1971-72 | 670 | 677 | 714 | 724 | 2785 |
| 1972-73 | 832 | 840 | 886 | 899 | 3457 |
| 1973-74 | 1267 | 1280 | 1367 | 1434 | 5347 |
| 1974-75 | 1984 | 2085 | 2284 | 2409 | 8762 |
| 1975-76 | 2283 | 2326 | 2434 | 2473 | 9516 |
| 1976-77 | 2592 | 2699 | 2939 | 2937 | 11166 |
| 1977-78 | 3229 | 3260 | 3464 | 3494 | 13446 |
| 1978-79 | 3689 | 3724 | 3940 | 4024 | 15377 |
| 1979-80 | 4373 | 4325 | 4608 | 4744 | 18050 |
| 1980-81 | 5371 | 5489 | 5867 | 6004 | 22731 |
| 1981-82 | 6217 | 6294 | 6620 | 6661 | 25792 |
| 1982-83 | 7106 | 7201 | 7575 | 7722 | 29604 |
| 1983-84 | 8155 | 8436 | 8791 | 8854 | 34236 |
| 1984-85 | 8946 | 9066 | 9601 | 9715 | 37328 |
| 1985-86 | 9945 | 10014 | 10524 | 10560 | 41043 |
| 1986-87 | 10797 | 10989 | 11441 | 11646 | 44872 |
| 1987-88 | 11907 | 12054 | 12665 | 13071 | 49696 |
| 1988-89 | 14152 | 14378 | 15125 | 15408 | 59063 |
| 1989-90 | 15385 | 15606 | 16454 | 16961 | 64406 |
| 1990-91 | 17623 | 18128 | 19322 | 19935 | 75008 |
| 1991-92 | 20121 | 20514 | 21882 | 22600 | 85117 |
| 1992-93 | 22773 | 23137 | 24558 | 25310 | 95778 |
| 1993-94 | 25333 | 26037 | 27809 | 28749 | 107927 |
| 1994-95 | 29234 | 30444 | 32825 | 33242 | 125745 |
| 1995-96 | 33876 | 34664 | 37099 | 37930 | 143569 |
| 1996-97 | 37828 | 39170 | 42615 | 43560 | 163172 |
| 1997-98 | 42865 | 43544 | 46153 | 47080 | 179642 |
| 1998-99 | 46882 | 47471 | 50017 | 50277 | 194648 |
| 1999-00 | 52945 | 53662 | 56507 | 57314 | 220429 |
| 2000-01 | 56711 | 57581 | 60303 | 60501 | 235096 |
| 2001-02 | 62706 | 63225 | 66605 | 67292 | 259827 |
| 2002-03 | 69580 | 69755 | 73286 | 73466 | 286087 |
| 2003-04 | 73880 | 75959 | 80241 | 82149 | 312228 |
| 2004-05 | 82545 | 83605 | 88076 | 89151 | 343377 |

**Gross Value Added of Social, Community & Personal Services**
(at current prices)

(Rs million)

| | Jul-Sep | Oct-Dec | Jan-Mar | Apr-Jun | Annual |
|---|---|---|---|---|---|
| 1970-71 | 878 | 898 | 915 | 940 | 3631 |
| 1971-72 | 967 | 988 | 1006 | 1035 | 3995 |
| 1972-73 | 1106 | 1130 | 1152 | 1186 | 4574 |
| 1973-74 | 1547 | 1582 | 1634 | 1738 | 6501 |
| 1974-75 | 1925 | 2049 | 2171 | 2323 | 8468 |
| 1975-76 | 2411 | 2494 | 2517 | 2576 | 9997 |
| 1976-77 | 2643 | 2765 | 2914 | 2982 | 11304 |
| 1977-78 | 3128 | 3224 | 3323 | 3394 | 13068 |
| 1978-79 | 3582 | 3647 | 3763 | 3979 | 14971 |
| 1979-80 | 4446 | 4553 | 4702 | 4826 | 18527 |
| 1980-81 | 5149 | 5271 | 5421 | 5629 | 21471 |
| 1981-82 | 6067 | 6206 | 6316 | 6467 | 25056 |
| 1982-83 | 6694 | 6885 | 7023 | 7288 | 27891 |
| 1983-84 | 7607 | 7992 | 8086 | 8302 | 31988 |
| 1984-85 | 8683 | 8957 | 9209 | 9480 | 36328 |
| 1985-86 | 9806 | 10029 | 10239 | 10489 | 40563 |
| 1986-87 | 10874 | 11285 | 11406 | 11789 | 45354 |
| 1987-88 | 12303 | 12645 | 12877 | 13507 | 51332 |
| 1988-89 | 14470 | 14935 | 15209 | 15704 | 60317 |
| 1989-90 | 16185 | 16632 | 16970 | 17763 | 67550 |
| 1990-91 | 18963 | 19755 | 20430 | 21518 | 80666 |
| 1991-92 | 22648 | 23530 | 24359 | 25546 | 96082 |
| 1992-93 | 26719 | 27560 | 28349 | 29687 | 112315 |
| 1993-94 | 31217 | 32557 | 33709 | 35451 | 132934 |
| 1994-95 | 37331 | 39557 | 41250 | 42194 | 160332 |
| 1995-96 | 44065 | 45499 | 47124 | 49112 | 185801 |
| 1996-97 | 51439 | 54121 | 57128 | 59462 | 222151 |
| 1997-98 | 61144 | 63173 | 64948 | 67358 | 256623 |
| 1998-99 | 69691 | 71652 | 73238 | 74989 | 289571 |
| 1999-00 | 77159 | 79599 | 81229 | 83564 | 321551 |
| 2000-01 | 85953 | 88446 | 89787 | 91699 | 355885 |
| 2001-02 | 94883 | 97184 | 99371 | 102216 | 393655 |
| 2002-03 | 104757 | 106925 | 108829 | 110369 | 430879 |
| 2003-04 | 112449 | 116972 | 119535 | 124255 | 473211 |
| 2004-05 | 142049 | 159727 | 144796 | 100845 | 547418 |

**Gross Domestic Product - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 519724 | 282250 | 108778 | 35239 | 945992 |
| 1971-72 | 541121 | 291563 | 109327 | 39276 | 981286 |
| 1972-73 | 575344 | 316054 | 116466 | 40353 | 1048217 |
| 1973-74 | 600179 | 334191 | 120292 | 47321 | 1101984 |
| 1974-75 | 619591 | 339321 | 120272 | 51119 | 1130304 |
| 1975-76 | 634021 | 351614 | 120018 | 53782 | 1159436 |
| 1976-77 | 649024 | 364755 | 127064 | 58985 | 1199828 |
| 1977-78 | 689184 | 400909 | 136614 | 63016 | 1289724 |
| 1978-79 | 724841 | 414976 | 151505 | 68341 | 1359664 |
| 1979-80 | 775479 | 463029 | 161374 | 73354 | 1473236 |
| 1980-81 | 799225 | 477983 | 175616 | 79596 | 1532420 |
| 1981-82 | 839140 | 518106 | 185384 | 88662 | 1631293 |
| 1982-83 | 893960 | 548648 | 194392 | 99742 | 1736742 |
| 1983-84 | 907146 | 571785 | 204765 | 106302 | 1789998 |
| 1984-85 | 995570 | 619460 | 217410 | 114281 | 1946721 |
| 1985-86 | 1062810 | 642638 | 228808 | 121184 | 2055440 |
| 1986-87 | 1095885 | 676999 | 243126 | 126064 | 2142073 |
| 1987-88 | 1159288 | 706595 | 259386 | 130192 | 2255461 |
| 1988-89 | 1213646 | 722802 | 278555 | 142020 | 2357024 |
| 1989-90 | 1251302 | 747907 | 295511 | 149183 | 2443904 |
| 1990-91 | 1326997 | 765828 | 290395 | 161834 | 2545054 |
| 1991-92 | 1403611 | 804746 | 315890 | 171472 | 2695718 |
| 1992-93 | 1433140 | 837563 | 322605 | 185099 | 2778407 |
| 1993-94 | 1446837 | 865348 | 341478 | 195049 | 2848712 |
| 1994-95 | 1548464 | 901999 | 352332 | 203931 | 3006727 |
| 1995-96 | 1600756 | 927461 | 353325 | 198950 | 3080492 |
| 1996-97 | 1601194 | 929015 | 379756 | 201617 | 3111582 |
| 1997-98 | 1654291 | 970915 | 395829 | 207585 | 3228622 |
| 1998-99 | 1709716 | 1000664 | 404006 | 211526 | 3325913 |
| 1999-00 | 1847138 | 1053164 | 416448 | 200224 | 3516973 |
| 2000-01 | 1874928 | 1091807 | 432133 | 201511 | 3600378 |
| 2001-02 | 1926470 | 1141676 | 445809 | 206394 | 3720350 |
| 2002-03 | 2018737 | 1192634 | 471572 | 210519 | 3893462 |
| 2003-04 | 2157196 | 1301298 | 498616 | 221948 | 4179058 |
| 2004-05 | 2347873 | 1434095 | 541107 | 230673 | 4553747 |

**Gross Value Added of Agriculture - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 233,339 | 83,355 | 43,503 | 11,507 | 371,703 |
| 1971-72 | 243,417 | 85,289 | 43,149 | 13,388 | 385,243 |
| 1972-73 | 248,206 | 87,986 | 44,467 | 12,290 | 392,949 |
| 1973-74 | 252,671 | 91,364 | 45,231 | 16,244 | 405,510 |
| 1974-75 | 251,565 | 86,251 | 42,531 | 15,750 | 396,098 |
| 1975-76 | 256,647 | 92,361 | 40,977 | 16,546 | 406,530 |
| 1976-77 | 258,987 | 96,623 | 42,768 | 17,995 | 416,372 |
| 1977-78 | 261,908 | 101,067 | 44,628 | 19,070 | 426,673 |
| 1978-79 | 276,982 | 102,667 | 49,378 | 20,185 | 449,212 |
| 1979-80 | 284,320 | 112,803 | 49,572 | 21,452 | 468,147 |
| 1980-81 | 295,340 | 114,596 | 54,225 | 22,552 | 486,714 |
| 1981-82 | 300,202 | 122,777 | 55,835 | 26,196 | 505,010 |
| 1982-83 | 315,324 | 123,847 | 57,439 | 30,297 | 526,908 |
| 1983-84 | 298,306 | 119,916 | 58,177 | 31,889 | 508,288 |
| 1984-85 | 333,020 | 125,010 | 60,143 | 33,798 | 551,970 |
| 1985-86 | 358,527 | 125,822 | 62,396 | 34,287 | 581,032 |
| 1986-87 | 355,122 | 132,721 | 66,989 | 36,611 | 591,444 |
| 1987-88 | 366,329 | 135,311 | 69,177 | 35,515 | 606,332 |
| 1988-89 | 389,363 | 141,616 | 71,471 | 38,416 | 640,866 |
| 1989-90 | 393,920 | 142,571 | 79,984 | 40,572 | 657,046 |
| 1990-91 | 416,092 | 148,720 | 71,900 | 41,767 | 678,479 |
| 1991-92 | 438,939 | 153,030 | 80,634 | 45,408 | 718,011 |
| 1992-93 | 417,334 | 147,963 | 75,589 | 49,574 | 690,460 |
| 1993-94 | 409,384 | 164,432 | 83,188 | 55,121 | 712,124 |
| 1994-95 | 444,569 | 162,892 | 82,657 | 58,908 | 749,025 |
| 1995-96 | 458,470 | 177,135 | 80,098 | 62,922 | 778,625 |
| 1996-97 | 446,408 | 186,740 | 86,382 | 61,546 | 781,075 |
| 1997-98 | 466,024 | 195,935 | 87,187 | 63,950 | 813,096 |
| 1998-99 | 467,506 | 207,221 | 87,332 | 63,295 | 825,354 |
| 1999-00 | 514,532 | 213,790 | 92,408 | 52,418 | 873,148 |
| 2000-01 | 502,903 | 207,495 | 96,947 | 52,025 | 859,370 |
| 2001-02 | 502,249 | 210,908 | 100,008 | 51,747 | 864,912 |
| 2002-03 | 514,535 | 217,834 | 105,069 | 53,991 | 891,430 |
| 2003-04 | 526,675 | 221,764 | 102,857 | 57,842 | 909,138 |
| 2004-05 | 580,687 | 234,733 | 101,894 | 60,574 | 977,889 |

**Gross Value Added of Major Crops - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 85,385 | 31,500 | 10,316 | 1,151 | 128,352 |
| 1971-72 | 92,131 | 32,843 | 10,783 | 1,283 | 137,040 |
| 1972-73 | 93,972 | 34,130 | 11,809 | 1,168 | 141,079 |
| 1973-74 | 96,382 | 36,632 | 12,939 | 2,123 | 148,076 |
| 1974-75 | 94,436 | 31,611 | 13,504 | 1,463 | 141,014 |
| 1975-76 | 99,967 | 34,977 | 13,494 | 1,414 | 149,852 |
| 1976-77 | 103,176 | 36,360 | 13,870 | 1,373 | 154,779 |
| 1977-78 | 102,288 | 38,671 | 13,983 | 1,949 | 156,890 |
| 1978-79 | 111,539 | 36,584 | 13,826 | 2,403 | 164,352 |
| 1979-80 | 116,405 | 44,963 | 14,516 | 2,788 | 178,672 |
| 1980-81 | 123,914 | 44,068 | 15,623 | 3,058 | 186,664 |
| 1981-82 | 120,676 | 50,411 | 16,694 | 5,375 | 193,156 |
| 1982-83 | 129,564 | 49,375 | 17,191 | 7,229 | 203,359 |
| 1983-84 | 105,701 | 43,421 | 16,551 | 7,327 | 173,000 |
| 1984-85 | 134,845 | 45,959 | 16,846 | 7,723 | 205,373 |
| 1985-86 | 154,785 | 43,348 | 16,965 | 6,812 | 221,911 |
| 1986-87 | 143,270 | 45,728 | 17,517 | 8,146 | 214,661 |
| 1987-88 | 153,661 | 47,415 | 17,574 | 5,698 | 224,347 |
| 1988-89 | 166,495 | 49,596 | 19,951 | 7,772 | 243,813 |
| 1989-90 | 169,700 | 45,605 | 20,647 | 8,155 | 244,107 |
| 1990-91 | 179,829 | 47,201 | 21,033 | 8,640 | 256,702 |
| 1991-92 | 209,780 | 52,467 | 21,315 | 8,891 | 292,454 |
| 1992-93 | 179,994 | 44,495 | 21,158 | 10,694 | 256,340 |
| 1993-94 | 169,690 | 56,416 | 20,688 | 9,904 | 256,699 |
| 1994-95 | 195,705 | 50,838 | 21,572 | 9,809 | 277,923 |
| 1995-96 | 204,605 | 57,326 | 21,678 | 12,382 | 295,990 |
| 1996-97 | 190,559 | 63,757 | 20,612 | 10,379 | 285,307 |
| 1997-98 | 207,507 | 67,122 | 23,009 | 12,272 | 309,910 |
| 1998-99 | 205,142 | 66,627 | 21,452 | 11,106 | 304,327 |
| 1999-00 | 243,518 | 69,125 | 20,104 | 9,257 | 342,004 |
| 2000-01 | 231,115 | 54,458 | 16,542 | 8,799 | 310,914 |
| 2001-02 | 225,193 | 51,128 | 17,838 | 8,764 | 302,923 |
| 2002-03 | 238,250 | 53,761 | 18,743 | 10,578 | 321,331 |
| 2003-04 | 243,373 | 56,127 | 18,298 | 10,809 | 328,607 |
| 2004-05 | 293,988 | 60,969 | 18,885 | 10,600 | 384,443 |

**Gross Value Added of Minor Crops - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 42,734 | 20,705 | 3,468 | 2,817 | 69,724 |
| 1971-72 | 44,750 | 21,246 | 3,963 | 4,032 | 73,992 |
| 1972-73 | 44,994 | 21,719 | 4,238 | 2,595 | 73,546 |
| 1973-74 | 45,737 | 22,260 | 5,407 | 5,073 | 78,477 |
| 1974-75 | 47,243 | 21,457 | 5,249 | 4,644 | 78,593 |
| 1975-76 | 47,757 | 23,079 | 6,171 | 4,831 | 81,838 |
| 1976-77 | 45,331 | 24,013 | 6,801 | 5,433 | 81,577 |
| 1977-78 | 45,034 | 24,438 | 6,864 | 5,329 | 81,664 |
| 1978-79 | 46,107 | 26,189 | 7,361 | 5,415 | 85,072 |
| 1979-80 | 46,075 | 26,077 | 7,236 | 5,736 | 85,124 |
| 1980-81 | 46,098 | 26,118 | 8,189 | 5,620 | 86,025 |
| 1981-82 | 50,271 | 25,948 | 7,958 | 6,187 | 90,365 |
| 1982-83 | 51,903 | 25,841 | 7,663 | 7,502 | 92,909 |
| 1983-84 | 53,899 | 25,063 | 7,494 | 8,030 | 94,485 |
| 1984-85 | 54,601 | 25,119 | 7,481 | 8,424 | 95,624 |
| 1985-86 | 54,968 | 25,723 | 7,869 | 8,895 | 97,455 |
| 1986-87 | 56,363 | 26,034 | 9,745 | 8,743 | 100,885 |
| 1987-88 | 54,142 | 24,533 | 10,227 | 9,713 | 98,615 |
| 1988-89 | 60,103 | 25,417 | 9,654 | 10,143 | 105,317 |
| 1989-90 | 61,450 | 27,045 | 9,568 | 11,416 | 109,478 |
| 1990-91 | 61,707 | 26,246 | 9,848 | 11,663 | 109,463 |
| 1991-92 | 62,130 | 24,073 | 9,898 | 14,773 | 110,874 |
| 1992-93 | 62,498 | 21,706 | 9,767 | 16,545 | 110,516 |
| 1993-94 | 65,456 | 24,133 | 10,382 | 22,421 | 122,392 |
| 1994-95 | 68,976 | 23,551 | 10,402 | 25,735 | 128,664 |
| 1995-96 | 67,370 | 25,527 | 10,044 | 26,288 | 129,229 |
| 1996-97 | 69,934 | 24,197 | 9,947 | 26,334 | 130,411 |
| 1997-98 | 70,770 | 25,243 | 9,824 | 26,317 | 132,156 |
| 1998-99 | 70,139 | 31,292 | 10,475 | 26,280 | 138,185 |
| 1999-00 | 69,846 | 29,447 | 10,867 | 15,520 | 125,680 |
| 2000-01 | 67,202 | 30,958 | 11,443 | 15,671 | 125,274 |
| 2001-02 | 66,595 | 27,861 | 11,442 | 14,300 | 120,199 |
| 2002-03 | 66,011 | 28,512 | 11,715 | 13,673 | 119,910 |
| 2003-04 | 67,103 | 27,538 | 11,478 | 15,743 | 121,863 |
| 2004-05 | 71,324 | 28,888 | 11,086 | 16,838 | 128,137 |

**Gross Value Added of Livestock - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 101,514 | 25,864 | 26,242 | 7,081 | 160,700 |
| 1971-72 | 102,620 | 26,836 | 24,752 | 7,590 | 161,798 |
| 1972-73 | 103,564 | 27,836 | 23,313 | 8,074 | 162,787 |
| 1973-74 | 104,557 | 28,928 | 21,997 | 8,596 | 164,078 |
| 1974-75 | 105,589 | 30,121 | 20,784 | 9,158 | 165,652 |
| 1975-76 | 106,673 | 31,433 | 19,671 | 9,764 | 167,541 |
| 1976-77 | 106,919 | 32,115 | 20,108 | 10,437 | 169,579 |
| 1977-78 | 109,831 | 33,600 | 21,027 | 11,028 | 175,486 |
| 1978-79 | 112,937 | 35,195 | 22,032 | 11,664 | 181,827 |
| 1979-80 | 115,562 | 36,638 | 22,673 | 12,256 | 187,129 |
| 1980-81 | 119,543 | 38,656 | 24,177 | 13,050 | 195,426 |
| 1981-82 | 122,943 | 40,496 | 25,255 | 13,794 | 202,488 |
| 1982-83 | 126,926 | 42,604 | 26,674 | 14,639 | 210,844 |
| 1983-84 | 131,042 | 44,818 | 28,139 | 15,532 | 219,531 |
| 1984-85 | 135,379 | 47,173 | 29,709 | 16,486 | 228,748 |
| 1985-86 | 139,930 | 49,674 | 31,381 | 17,503 | 238,488 |
| 1986-87 | 145,830 | 53,555 | 33,278 | 18,653 | 251,315 |
| 1987-88 | 148,181 | 56,226 | 34,435 | 18,994 | 257,836 |
| 1988-89 | 150,689 | 59,069 | 35,667 | 19,361 | 264,786 |
| 1989-90 | 153,260 | 62,059 | 36,911 | 19,743 | 271,973 |
| 1990-91 | 155,856 | 65,188 | 38,134 | 20,132 | 279,311 |
| 1991-92 | 158,447 | 68,449 | 39,305 | 20,524 | 286,725 |
| 1992-93 | 161,375 | 71,991 | 40,690 | 20,974 | 295,030 |
| 1993-94 | 164,462 | 75,757 | 42,160 | 21,457 | 303,837 |
| 1994-95 | 167,741 | 79,778 | 43,749 | 21,983 | 313,252 |
| 1995-96 | 172,692 | 84,770 | 46,826 | 22,839 | 327,128 |
| 1996-97 | 176,031 | 89,227 | 48,428 | 23,422 | 337,108 |
| 1997-98 | 178,986 | 93,694 | 49,585 | 23,948 | 346,213 |
| 1998-99 | 182,375 | 98,595 | 51,092 | 24,595 | 356,657 |
| 1999-00 | 185,797 | 103,751 | 52,562 | 25,299 | 367,409 |
| 2000-01 | 191,193 | 110,969 | 54,411 | 26,177 | 382,750 |
| 2001-02 | 197,292 | 120,801 | 56,929 | 27,163 | 402,185 |
| 2002-03 | 197,842 | 125,422 | 57,831 | 28,333 | 409,427 |
| 2003-04 | 200,848 | 128,101 | 59,686 | 29,824 | 418,459 |
| 2004-05 | 204,517 | 135,049 | 61,524 | 31,731 | 432,821 |

**Gross Value Added of Fishing - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 135 | 4,031 | 1 | 333 | 4,499 |
| 1971-72 | 168 | 3,047 | 4 | 351 | 3,570 |
| 1972-73 | 210 | 2,368 | 12 | 371 | 2,960 |
| 1973-74 | 263 | 1,901 | 35 | 391 | 2,590 |
| 1974-75 | 339 | 1,928 | 12 | 404 | 2,683 |
| 1975-76 | 490 | 2,395 | 333 | 485 | 3,703 |
| 1976-77 | 560 | 2,969 | 35 | 676 | 4,241 |
| 1977-78 | 642 | 3,229 | 47 | 672 | 4,590 |
| 1978-79 | 765 | 3,503 | 53 | 613 | 4,934 |
| 1979-80 | 963 | 3,411 | 53 | 567 | 4,994 |
| 1980-81 | 1,086 | 4,017 | 53 | 702 | 5,858 |
| 1981-82 | 1,238 | 4,198 | 35 | 715 | 6,185 |
| 1982-83 | 1,302 | 4,175 | 35 | 791 | 6,304 |
| 1983-84 | 1,471 | 4,781 | 47 | 850 | 7,150 |
| 1984-85 | 1,617 | 4,974 | 47 | 1,023 | 7,661 |
| 1985-86 | 1,897 | 5,329 | 41 | 898 | 8,165 |
| 1986-87 | 2,172 | 5,573 | 47 | 860 | 8,652 |
| 1987-88 | 2,452 | 5,599 | 29 | 984 | 9,064 |
| 1988-89 | 2,709 | 5,756 | 64 | 956 | 9,484 |
| 1989-90 | 3,001 | 6,102 | 88 | 1,054 | 10,244 |
| 1990-91 | 3,182 | 6,293 | 198 | 1,053 | 10,726 |
| 1991-92 | 3,398 | 6,641 | 198 | 1,104 | 11,341 |
| 1992-93 | 3,427 | 7,250 | 204 | 1,178 | 12,060 |
| 1993-94 | 3,888 | 7,097 | 64 | 1,210 | 12,260 |
| 1994-95 | 3,468 | 7,184 | 93 | 1,204 | 11,950 |
| 1995-96 | 3,929 | 7,992 | 88 | 1,230 | 13,239 |
| 1996-97 | 3,742 | 8,853 | 53 | 1,282 | 13,930 |
| 1997-98 | 3,269 | 9,199 | 53 | 1,286 | 13,807 |
| 1998-99 | 3,836 | 10,060 | 58 | 1,210 | 15,164 |
| 1999-00 | 3,608 | 9,667 | 58 | 1,275 | 14,608 |
| 2000-01 | 3,620 | 9,847 | 64 | 1,330 | 14,861 |
| 2001-02 | 3,795 | 9,957 | 76 | 1,342 | 15,170 |
| 2002-03 | 3,585 | 8,663 | 117 | 1,247 | 13,611 |
| 2003-04 | 3,678 | 8,834 | 146 | 1,258 | 13,916 |
| 2004-05 | 3,795 | 8,960 | 152 | 1,278 | 14,185 |

**Gross Value Added of Forestry - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 3,572 | 1,255 | 3,475 | 125 | 8,428 |
| 1971-72 | 3,748 | 1,317 | 3,647 | 132 | 8,843 |
| 1972-73 | 5,466 | 1,933 | 5,095 | 83 | 12,577 |
| 1973-74 | 5,732 | 1,643 | 4,854 | 61 | 12,290 |
| 1974-75 | 3,958 | 1,135 | 2,983 | 80 | 8,156 |
| 1975-76 | 1,759 | 478 | 1,308 | 51 | 3,596 |
| 1976-77 | 3,000 | 1,166 | 1,954 | 76 | 6,197 |
| 1977-78 | 4,113 | 1,130 | 2,707 | 92 | 8,043 |
| 1978-79 | 5,635 | 1,195 | 6,107 | 90 | 13,026 |
| 1979-80 | 5,314 | 1,715 | 5,094 | 105 | 12,228 |
| 1980-81 | 4,699 | 1,737 | 6,184 | 122 | 12,741 |
| 1981-82 | 5,074 | 1,724 | 5,892 | 125 | 12,816 |
| 1982-83 | 5,629 | 1,850 | 5,876 | 136 | 13,492 |
| 1983-84 | 6,194 | 1,833 | 5,946 | 149 | 14,123 |
| 1984-85 | 6,578 | 1,785 | 6,061 | 141 | 14,565 |
| 1985-86 | 6,947 | 1,748 | 6,140 | 179 | 15,014 |
| 1986-87 | 7,487 | 1,831 | 6,402 | 210 | 15,930 |
| 1987-88 | 7,893 | 1,539 | 6,913 | 126 | 16,471 |
| 1988-89 | 9,368 | 1,779 | 6,134 | 184 | 17,465 |
| 1989-90 | 6,508 | 1,760 | 12,771 | 205 | 21,243 |
| 1990-91 | 15,519 | 3,793 | 2,686 | 279 | 22,277 |
| 1991-92 | 5,184 | 1,399 | 9,917 | 116 | 16,616 |
| 1992-93 | 10,041 | 2,521 | 3,769 | 184 | 16,515 |
| 1993-94 | 5,887 | 1,029 | 9,893 | 128 | 16,937 |
| 1994-95 | 8,679 | 1,541 | 6,840 | 176 | 17,237 |
| 1995-96 | 9,874 | 1,520 | 1,462 | 183 | 13,039 |
| 1996-97 | 6,141 | 706 | 7,343 | 130 | 14,319 |
| 1997-98 | 5,491 | 676 | 4,716 | 126 | 11,010 |
| 1998-99 | 6,014 | 648 | 4,256 | 105 | 11,022 |
| 1999-00 | 11,763 | 1,800 | 8,817 | 1,066 | 23,447 |
| 2000-01 | 9,773 | 1,263 | 14,487 | 48 | 25,571 |
| 2001-02 | 9,373 | 1,161 | 13,724 | 178 | 24,436 |
| 2002-03 | 8,848 | 1,477 | 16,664 | 161 | 27,150 |
| 2003-04 | 11,673 | 1,164 | 13,248 | 207 | 26,293 |
| 2004-05 | 7,064 | 866 | 10,247 | 127 | 18,304 |

**Gross Value Added of Industry - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 103,180 | 77,195 | 19,162 | 8,647 | 208,185 |
| 1971-72 | 103,324 | 77,730 | 18,709 | 8,904 | 208,666 |
| 1972-73 | 114,112 | 85,329 | 20,739 | 9,615 | 229,795 |
| 1973-74 | 122,349 | 92,402 | 21,962 | 10,842 | 247,555 |
| 1974-75 | 125,125 | 92,934 | 22,188 | 12,147 | 252,393 |
| 1975-76 | 131,086 | 95,437 | 22,920 | 13,250 | 262,693 |
| 1976-77 | 137,583 | 96,555 | 23,772 | 14,775 | 272,685 |
| 1977-78 | 147,949 | 106,148 | 25,780 | 16,144 | 296,021 |
| 1978-79 | 154,751 | 110,288 | 27,227 | 17,431 | 309,696 |
| 1979-80 | 169,269 | 120,759 | 29,744 | 19,640 | 339,412 |
| 1980-81 | 175,993 | 136,066 | 34,825 | 22,339 | 369,222 |
| 1981-82 | 193,341 | 152,336 | 38,634 | 24,304 | 408,615 |
| 1982-83 | 204,481 | 164,108 | 40,975 | 25,171 | 434,735 |
| 1983-84 | 213,832 | 170,776 | 43,222 | 26,796 | 454,626 |
| 1984-85 | 236,460 | 192,329 | 47,888 | 29,277 | 505,953 |
| 1985-86 | 251,017 | 202,089 | 50,366 | 30,399 | 533,872 |
| 1986-87 | 261,689 | 210,341 | 52,553 | 30,492 | 555,074 |
| 1987-88 | 283,478 | 220,140 | 58,115 | 33,055 | 594,787 |
| 1988-89 | 291,451 | 224,352 | 60,335 | 34,756 | 610,894 |
| 1989-90 | 301,480 | 231,747 | 62,098 | 37,505 | 632,830 |
| 1990-91 | 322,828 | 232,417 | 64,725 | 43,032 | 663,002 |
| 1991-92 | 339,250 | 243,075 | 68,400 | 46,470 | 697,196 |
| 1992-93 | 350,635 | 250,463 | 72,839 | 48,295 | 722,231 |
| 1993-94 | 357,625 | 255,473 | 75,665 | 49,888 | 738,651 |
| 1994-95 | 374,008 | 264,431 | 79,998 | 52,126 | 770,562 |
| 1995-96 | 380,966 | 271,592 | 80,249 | 43,730 | 776,538 |
| 1996-97 | 377,482 | 262,128 | 84,386 | 44,174 | 768,170 |
| 1997-98 | 391,764 | 272,515 | 86,330 | 44,894 | 795,504 |
| 1998-99 | 410,114 | 282,479 | 90,363 | 46,854 | 829,810 |
| 1999-00 | 423,348 | 286,511 | 92,090 | 48,264 | 850,213 |
| 2000-01 | 436,010 | 302,013 | 94,305 | 50,308 | 882,635 |
| 2001-02 | 447,912 | 310,789 | 96,612 | 51,956 | 907,269 |
| 2002-03 | 464,238 | 331,129 | 102,713 | 52,398 | 950,478 |
| 2003-04 | 535,323 | 382,683 | 116,752 | 55,635 | 1,090,392 |
| 2004-05 | 589,403 | 429,565 | 127,701 | 59,435 | 1,206,103 |

**Gross Value Added of Mining & Quarrying - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | N.W.F.P. | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 3546 | 1581 | 56 | 3490 | 8673 |
| 1971-72 | 3614 | 1612 | 57 | 3557 | 8840 |
| 1972-73 | 4035 | 1530 | 58 | 3328 | 8951 |
| 1973-74 | 3749 | 1692 | 55 | 3654 | 9151 |
| 1974-75 | 3345 | 1746 | 62 | 3984 | 9137 |
| 1975-76 | 3403 | 1629 | 185 | 3795 | 9012 |
| 1976-77 | 5926 | 1554 | 102 | 3921 | 11503 |
| 1977-78 | 5732 | 1888 | 185 | 4202 | 12007 |
| 1978-79 | 5358 | 1980 | 208 | 4613 | 12161 |
| 1979-80 | 5716 | 1379 | 191 | 5555 | 12841 |
| 1980-81 | 5476 | 2427 | 249 | 6002 | 14154 |
| 1981-82 | 5894 | 2898 | 222 | 6284 | 15298 |
| 1982-83 | 5853 | 4429 | 200 | 6423 | 16905 |
| 1983-84 | 5523 | 4879 | 317 | 6648 | 17367 |
| 1984-85 | 7752 | 7467 | 387 | 7028 | 22633 |
| 1985-86 | 11139 | 10341 | 650 | 7115 | 29244 |
| 1986-87 | 11685 | 11295 | 752 | 6971 | 30703 |
| 1987-88 | 12511 | 12653 | 999 | 7515 | 33678 |
| 1988-89 | 12468 | 13426 | 1009 | 7780 | 34682 |
| 1989-90 | 13587 | 15544 | 1129 | 8376 | 38636 |
| 1990-91 | 14728 | 19811 | 1475 | 8363 | 44376 |
| 1991-92 | 14386 | 18985 | 1331 | 8893 | 43595 |
| 1992-93 | 13318 | 20441 | 1422 | 8929 | 44109 |
| 1993-94 | 12775 | 20792 | 1436 | 8965 | 43969 |
| 1994-95 | 12614 | 20395 | 1379 | 8824 | 43212 |
| 1995-96 | 13357 | 22449 | 1703 | 8218 | 45728 |
| 1996-97 | 12845 | 23435 | 1898 | 8485 | 46662 |
| 1997-98 | 12745 | 23471 | 2023 | 8395 | 46634 |
| 1998-99 | 12540 | 22380 | 2097 | 9144 | 46162 |
| 1999-00 | 13867 | 22307 | 2108 | 10033 | 48315 |
| 2000-01 | 13110 | 22762 | 2111 | 10621 | 48604 |
| 2001-02 | 13593 | 25433 | 1571 | 10653 | 51249 |
| 2002-03 | 14523 | 30613 | 4312 | 9521 | 58969 |
| 2003-04 | 14988 | 33427 | 3792 | 9270 | 61477 |
| 2004-05 | 14639 | 37493 | 3627 | 9159 | 64917 |

**Gross Value Added of Large-scale Manufacturing - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 54155 | 58960 | 10078 | 339 | 123532 |
| 1971-72 | 53900 | 58683 | 10031 | 337 | 122950 |
| 1972-73 | 58846 | 64068 | 10951 | 368 | 134233 |
| 1973-74 | 62415 | 67954 | 11616 | 390 | 142375 |
| 1974-75 | 61447 | 66899 | 11435 | 384 | 140165 |
| 1975-76 | 61090 | 66511 | 11369 | 382 | 139351 |
| 1976-77 | 59713 | 65012 | 11113 | 373 | 136210 |
| 1977-78 | 65679 | 71507 | 12223 | 411 | 149820 |
| 1978-79 | 67650 | 73654 | 12590 | 423 | 154317 |
| 1979-80 | 75000 | 81656 | 13958 | 469 | 171083 |
| 1980-81 | 78280 | 93642 | 18430 | 1878 | 192230 |
| 1981-82 | 89204 | 106710 | 21002 | 2140 | 219055 |
| 1982-83 | 96560 | 115510 | 22733 | 2317 | 237120 |
| 1983-84 | 98688 | 118055 | 23234 | 2368 | 242345 |
| 1984-85 | 111760 | 133692 | 26312 | 2682 | 274446 |
| 1985-86 | 113745 | 136067 | 26779 | 2729 | 279321 |
| 1986-87 | 116160 | 138955 | 27348 | 2787 | 285250 |
| 1987-88 | 122869 | 146982 | 28928 | 2948 | 301727 |
| 1988-89 | 120971 | 144711 | 28481 | 2903 | 297066 |
| 1989-90 | 121041 | 144794 | 28497 | 2904 | 297236 |
| 1990-91 | 127975 | 134177 | 28130 | 6235 | 296517 |
| 1991-92 | 133363 | 139826 | 29315 | 6498 | 309002 |
| 1992-93 | 134131 | 140631 | 29484 | 6535 | 310780 |
| 1993-94 | 133011 | 139458 | 29238 | 6481 | 308187 |
| 1994-95 | 135199 | 141751 | 29718 | 6587 | 313255 |
| 1995-96 | 142132 | 149020 | 31242 | 6925 | 329319 |
| 1996-97 | 134786 | 141318 | 29628 | 6567 | 312298 |
| 1997-98 | 139403 | 146159 | 30643 | 6792 | 322996 |
| 1998-99 | 143247 | 150189 | 31488 | 6979 | 331903 |
| 1999-00 | 146138 | 153221 | 32123 | 7120 | 338602 |
| 2000-01 | 162144 | 170002 | 35641 | 7900 | 375687 |
| 2001-02 | 167829 | 175962 | 36891 | 8177 | 388859 |
| 2002-03 | 179955 | 188676 | 39556 | 8768 | 416955 |
| 2003-04 | 212616 | 222921 | 46736 | 10359 | 492632 |
| 2004-05 | 245717 | 257625 | 54012 | 11972 | 569325 |

**Gross Value Added of Small-scale Manufacturing - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 12233 | 5308 | 823 | 167 | 18531 |
| 1971-72 | 13126 | 5696 | 883 | 179 | 19884 |
| 1972-73 | 14084 | 6111 | 947 | 192 | 21336 |
| 1973-74 | 15113 | 6558 | 1017 | 206 | 22893 |
| 1974-75 | 16216 | 7036 | 1091 | 221 | 24564 |
| 1975-76 | 17400 | 7550 | 1170 | 238 | 26358 |
| 1976-77 | 18670 | 8101 | 1256 | 255 | 28282 |
| 1977-78 | 20238 | 8782 | 1361 | 276 | 30657 |
| 1978-79 | 21938 | 9519 | 1476 | 300 | 33232 |
| 1979-80 | 23781 | 10319 | 1600 | 325 | 36024 |
| 1980-81 | 25778 | 11186 | 1734 | 352 | 39050 |
| 1981-82 | 27944 | 12125 | 1880 | 382 | 42330 |
| 1982-83 | 30291 | 13144 | 2038 | 414 | 45886 |
| 1983-84 | 32835 | 14248 | 2209 | 448 | 49740 |
| 1984-85 | 35594 | 15445 | 2394 | 486 | 53919 |
| 1985-86 | 38584 | 16742 | 2595 | 527 | 58448 |
| 1986-87 | 41825 | 18148 | 2813 | 571 | 63357 |
| 1987-88 | 48359 | 15336 | 4184 | 800 | 68679 |
| 1988-89 | 50927 | 16150 | 4406 | 843 | 72326 |
| 1989-90 | 53631 | 17008 | 4640 | 888 | 76167 |
| 1990-91 | 56479 | 17911 | 4886 | 935 | 80211 |
| 1991-92 | 59478 | 18862 | 5145 | 984 | 84470 |
| 1992-93 | 62637 | 19864 | 5419 | 1037 | 88956 |
| 1993-94 | 65963 | 20919 | 5706 | 1092 | 93679 |
| 1994-95 | 69465 | 22029 | 6009 | 1150 | 98654 |
| 1995-96 | 73154 | 23199 | 6329 | 1211 | 103892 |
| 1996-97 | 77219 | 20671 | 10730 | 790 | 109409 |
| 1997-98 | 81319 | 21768 | 11299 | 831 | 115219 |
| 1998-99 | 86898 | 23261 | 12075 | 889 | 123123 |
| 1999-00 | 93424 | 25008 | 12981 | 955 | 132369 |
| 2000-01 | 100440 | 26887 | 13956 | 1027 | 142310 |
| 2001-02 | 107983 | 28906 | 15004 | 1104 | 152997 |
| 2002-03 | 116093 | 31077 | 16131 | 1187 | 164487 |
| 2003-04 | 124811 | 33410 | 17343 | 1276 | 176841 |
| 2004-05 | 134185 | 35919 | 18645 | 1372 | 190121 |

**Gross Value Added of Slaughtering - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 9857.7 | 2504.0 | 3890.4 | 2520.8 | 18773 |
| 1971-72 | 11113.4 | 2971.0 | 3988.1 | 3019.4 | 21092 |
| 1972-73 | 12620.0 | 3572.6 | 4117.0 | 3619.9 | 23930 |
| 1973-74 | 14210.7 | 4283.3 | 4216.1 | 4273.3 | 26983 |
| 1974-75 | 15706.9 | 5065.5 | 4243.6 | 4944.5 | 29960 |
| 1975-76 | 17303.1 | 5997.7 | 4260.7 | 5686.4 | 33248 |
| 1976-77 | 20280.0 | 7211.4 | 5167.2 | 6982.6 | 39641 |
| 1977-78 | 21091.4 | 7692.3 | 5543.5 | 7623.2 | 41950 |
| 1978-79 | 21848.6 | 8165.5 | 5923.9 | 8269.0 | 44207 |
| 1979-80 | 22566.8 | 8637.5 | 6304.2 | 8953.2 | 46462 |
| 1980-81 | 23382.8 | 9156.4 | 6738.3 | 9698.2 | 48976 |
| 1981-82 | 24055.2 | 9637.7 | 7083.2 | 10495.9 | 51272 |
| 1982-83 | 24903.0 | 10177.8 | 7637.6 | 11257.8 | 53976 |
| 1983-84 | 26311.2 | 10971.1 | 8298.1 | 12415.9 | 57996 |
| 1984-85 | 27844.3 | 11835.0 | 9031.7 | 13708.8 | 62420 |
| 1985-86 | 29968.9 | 12761.1 | 9936.7 | 14208.4 | 66875 |
| 1986-87 | 28642.1 | 12598.2 | 9721.2 | 13779.4 | 64741 |
| 1987-88 | 30985.8 | 13985.7 | 10876.1 | 14883.3 | 70731 |
| 1988-89 | 33547.2 | 15547.9 | 12140.5 | 16137.6 | 77373 |
| 1989-90 | 35852.0 | 17146.1 | 13052.6 | 17552.7 | 83603 |
| 1990-91 | 38368.7 | 18890.0 | 14140.2 | 19018.2 | 90417 |
| 1991-92 | 41295.2 | 20842.6 | 15658.3 | 20480.4 | 98276 |
| 1992-93 | 45015.1 | 23093.4 | 18380.3 | 21658.1 | 108147 |
| 1993-94 | 48315.6 | 25391.6 | 20338.1 | 23238.9 | 117284 |
| 1994-95 | 51344.8 | 27673.8 | 22032.5 | 24833.0 | 125884 |
| 1995-96 | 39772.0 | 21412.0 | 17910.0 | 16109.9 | 95204 |
| 1996-97 | 40851.0 | 22536.5 | 19022.3 | 16531.4 | 98941 |
| 1997-98 | 41119.8 | 23403.5 | 18262.5 | 17113.0 | 99899 |
| 1998-99 | 42130.9 | 24542.7 | 19288.0 | 17424.5 | 103386 |
| 1999-00 | 41956.9 | 25030.7 | 19599.8 | 17323.1 | 103910 |
| 2000-01 | 43215.4 | 26387.0 | 20653.1 | 17781.8 | 108037 |
| 2001-02 | 44372.7 | 27725.3 | 21666.0 | 18214.6 | 111979 |
| 2002-03 | 45592.2 | 29145.7 | 22734.7 | 18691.8 | 116164 |
| 2003-04 | 46994.9 | 30729.7 | 23759.8 | 19290.7 | 120775 |
| 2004-05 | 46793.1 | 31296.2 | 24034.7 | 19266.2 | 121390 |

**Gross Value Added of Construction - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 12505 | 4091 | 3096 | 1872 | 21563 |
| 1971-72 | 10393 | 3590 | 2511 | 1543 | 18037 |
| 1972-73 | 11858 | 4327 | 2896 | 1796 | 20877 |
| 1973-74 | 13140 | 4852 | 3176 | 1984 | 23151 |
| 1974-75 | 15383 | 5854 | 3815 | 2275 | 27327 |
| 1975-76 | 18234 | 6927 | 4402 | 2745 | 32308 |
| 1976-77 | 17962 | 7075 | 4369 | 2749 | 32154 |
| 1977-78 | 19375 | 7711 | 4787 | 3009 | 34882 |
| 1978-79 | 20677 | 8308 | 5025 | 3156 | 37165 |
| 1979-80 | 23123 | 9401 | 5601 | 3621 | 41747 |
| 1980-81 | 22263 | 9069 | 5432 | 3578 | 40341 |
| 1981-82 | 25408 | 10241 | 6142 | 4065 | 45857 |
| 1982-83 | 24807 | 9955 | 5754 | 3734 | 44251 |
| 1983-84 | 26322 | 10808 | 6059 | 3782 | 46972 |
| 1984-85 | 28577 | 11812 | 6545 | 4135 | 51068 |
| 1985-86 | 30382 | 12879 | 6925 | 4456 | 54642 |
| 1986-87 | 33996 | 14798 | 7606 | 4860 | 61261 |
| 1987-88 | 35522 | 15537 | 7943 | 5086 | 64087 |
| 1988-89 | 37273 | 16712 | 8300 | 4968 | 67253 |
| 1989-90 | 35841 | 17017 | 8012 | 5417 | 66287 |
| 1990-91 | 39980 | 18768 | 8590 | 5718 | 73055 |
| 1991-92 | 41760 | 19613 | 8970 | 6528 | 76871 |
| 1992-93 | 43386 | 20658 | 9247 | 6943 | 80233 |
| 1993-94 | 43884 | 21551 | 9511 | 6812 | 81758 |
| 1994-95 | 44106 | 21983 | 9307 | 7043 | 82440 |
| 1995-96 | 45961 | 23086 | 9516 | 7135 | 85698 |
| 1996-97 | 46229 | 22922 | 9649 | 7601 | 86402 |
| 1997-98 | 47335 | 23129 | 9586 | 7286 | 87336 |
| 1998-99 | 44777 | 21741 | 9331 | 7240 | 83089 |
| 1999-00 | 47333 | 23039 | 9571 | 7447 | 87390 |
| 2000-01 | 47401 | 23311 | 9274 | 8045 | 88031 |
| 2001-02 | 47703 | 24514 | 9679 | 7927 | 89823 |
| 2002-03 | 49261 | 26183 | 9754 | 8276 | 93473 |
| 2003-04 | 44490 | 21787 | 8872 | 7494 | 82644 |
| 2004-05 | 53251 | 26155 | 10656 | 8922 | 98983 |

**Gross Value Added of Electricity, Gas & Water Supply - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 10884 | 4750 | 1219 | 259 | 17113 |
| 1971-72 | 11177 | 5179 | 1240 | 268 | 17863 |
| 1972-73 | 12669 | 5719 | 1769 | 311 | 20469 |
| 1973-74 | 13722 | 7063 | 1883 | 334 | 23001 |
| 1974-75 | 13027 | 6333 | 1541 | 338 | 21239 |
| 1975-76 | 13656 | 6824 | 1533 | 403 | 22417 |
| 1976-77 | 15032 | 7603 | 1765 | 495 | 24894 |
| 1977-78 | 15833 | 8569 | 1680 | 623 | 26704 |
| 1978-79 | 17279 | 8661 | 2004 | 671 | 28615 |
| 1979-80 | 19082 | 9366 | 2090 | 718 | 31256 |
| 1980-81 | 20813 | 10586 | 2243 | 830 | 34472 |
| 1981-82 | 20835 | 10725 | 2305 | 937 | 34802 |
| 1982-83 | 22066 | 10893 | 2612 | 1026 | 36597 |
| 1983-84 | 24153 | 11815 | 3104 | 1133 | 40206 |
| 1984-85 | 24934 | 12078 | 3218 | 1238 | 41467 |
| 1985-86 | 27200 | 13299 | 3480 | 1364 | 45342 |
| 1986-87 | 29381 | 14546 | 4313 | 1522 | 49762 |
| 1987-88 | 33230 | 15646 | 5186 | 1822 | 55884 |
| 1988-89 | 36264 | 17805 | 5999 | 2125 | 62193 |
| 1989-90 | 41528 | 20238 | 6767 | 2367 | 70900 |
| 1990-91 | 45298 | 22861 | 7504 | 2763 | 78425 |
| 1991-92 | 48968 | 24946 | 7980 | 3087 | 84981 |
| 1992-93 | 52148 | 25776 | 8887 | 3194 | 90005 |
| 1993-94 | 53676 | 27362 | 9436 | 3299 | 93774 |
| 1994-95 | 61278 | 30599 | 11551 | 3689 | 107117 |
| 1995-96 | 66591 | 32426 | 13549 | 4131 | 116697 |
| 1996-97 | 65553 | 31246 | 13459 | 4200 | 114457 |
| 1997-98 | 69843 | 34584 | 14517 | 4477 | 123420 |
| 1998-99 | 80521 | 40364 | 16084 | 5178 | 142148 |
| 1999-00 | 80628 | 37906 | 15707 | 5386 | 139627 |
| 2000-01 | 69699 | 32665 | 12669 | 4933 | 119966 |
| 2001-02 | 66432 | 28249 | 11800 | 5881 | 112362 |
| 2002-03 | 58814 | 25435 | 10225 | 5955 | 100429 |
| 2003-04 | 91422 | 40408 | 16249 | 7944 | 156024 |
| 2004-05 | 94819 | 41076 | 16727 | 8743 | 161366 |

**Gross Value Added of Services - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 183,205 | 121,700 | 46,114 | 15,085 | 366,104 |
| 1971-72 | 194,381 | 128,544 | 47,469 | 16,984 | 387,377 |
| 1972-73 | 213,025 | 142,739 | 51,260 | 18,448 | 425,473 |
| 1973-74 | 225,159 | 150,426 | 53,099 | 20,235 | 448,920 |
| 1974-75 | 242,901 | 160,136 | 55,553 | 23,222 | 481,813 |
| 1975-76 | 246,289 | 163,815 | 56,121 | 23,987 | 490,212 |
| 1976-77 | 252,454 | 171,576 | 60,525 | 26,216 | 510,770 |
| 1977-78 | 279,328 | 193,694 | 66,207 | 27,802 | 567,030 |
| 1978-79 | 293,108 | 202,022 | 74,900 | 30,725 | 600,755 |
| 1979-80 | 321,891 | 229,467 | 82,057 | 32,262 | 665,677 |
| 1980-81 | 327,892 | 227,322 | 86,565 | 34,705 | 676,484 |
| 1981-82 | 345,597 | 242,993 | 90,915 | 38,162 | 717,668 |
| 1982-83 | 374,155 | 260,693 | 95,977 | 44,274 | 775,099 |
| 1983-84 | 395,008 | 281,093 | 103,366 | 47,617 | 827,084 |
| 1984-85 | 426,090 | 302,122 | 109,379 | 51,206 | 888,797 |
| 1985-86 | 453,266 | 314,727 | 116,045 | 56,498 | 940,536 |
| 1986-87 | 479,074 | 333,937 | 123,584 | 58,961 | 995,556 |
| 1987-88 | 509,481 | 351,144 | 132,094 | 61,623 | 1,054,341 |
| 1988-89 | 532,832 | 356,833 | 146,750 | 68,848 | 1,105,264 |
| 1989-90 | 555,902 | 373,589 | 153,430 | 71,106 | 1,154,027 |
| 1990-91 | 588,077 | 384,691 | 153,771 | 77,034 | 1,203,572 |
| 1991-92 | 625,421 | 408,641 | 166,856 | 79,594 | 1,280,511 |
| 1992-93 | 665,171 | 439,137 | 174,177 | 87,230 | 1,365,715 |
| 1993-94 | 679,829 | 445,442 | 182,625 | 90,040 | 1,397,936 |
| 1994-95 | 729,888 | 474,677 | 189,677 | 92,898 | 1,487,140 |
| 1995-96 | 761,320 | 478,733 | 192,978 | 92,299 | 1,525,329 |
| 1996-97 | 777,304 | 480,147 | 208,988 | 95,898 | 1,562,337 |
| 1997-98 | 796,503 | 502,465 | 222,312 | 98,742 | 1,620,021 |
| 1998-99 | 832,097 | 510,965 | 226,311 | 101,376 | 1,670,748 |
| 1999-00 | 909,258 | 552,863 | 231,949 | 99,542 | 1,793,612 |
| 2000-01 | 936,015 | 582,299 | 240,880 | 99,179 | 1,858,372 |
| 2001-02 | 976,309 | 619,979 | 249,190 | 102,691 | 1,948,168 |
| 2002-03 | 1,039,964 | 643,671 | 263,790 | 104,129 | 2,051,554 |
| 2003-04 | 1,095,198 | 696,851 | 279,008 | 108,471 | 2,179,528 |
| 2004-05 | 1,177,783 | 769,797 | 311,512 | 110,664 | 2,369,756 |

**Gross Value Added of Trade, and Hotels & Restaurants - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 86307 | 51678 | 20519 | 6422 | 164927 |
| 1971-72 | 92178 | 54229 | 20704 | 7467 | 174578 |
| 1972-73 | 102638 | 61961 | 22575 | 7908 | 195082 |
| 1973-74 | 108695 | 67089 | 23195 | 9498 | 208478 |
| 1974-75 | 111703 | 68518 | 21997 | 10183 | 212401 |
| 1975-76 | 109796 | 68364 | 20571 | 10672 | 209403 |
| 1976-77 | 110613 | 69668 | 21419 | 11693 | 213393 |
| 1977-78 | 117870 | 75958 | 23195 | 12465 | 229489 |
| 1978-79 | 128071 | 81468 | 26852 | 13630 | 250021 |
| 1979-80 | 135257 | 88627 | 27562 | 14596 | 266042 |
| 1980-81 | 138088 | 96293 | 31584 | 16109 | 282074 |
| 1981-82 | 147043 | 104560 | 33154 | 17329 | 302087 |
| 1982-83 | 157073 | 111585 | 34986 | 18837 | 322481 |
| 1983-84 | 160498 | 116123 | 36518 | 20046 | 333184 |
| 1984-85 | 177695 | 128014 | 39367 | 21589 | 366665 |
| 1985-86 | 187371 | 131500 | 40758 | 22133 | 381762 |
| 1986-87 | 193872 | 136381 | 42891 | 23085 | 396229 |
| 1987-88 | 203306 | 140021 | 45545 | 23813 | 412685 |
| 1988-89 | 212864 | 143740 | 46741 | 25063 | 428408 |
| 1989-90 | 215505 | 146217 | 50717 | 26090 | 438529 |
| 1990-91 | 228064 | 144622 | 46689 | 28576 | 447951 |
| 1991-92 | 244758 | 156588 | 53859 | 31711 | 486916 |
| 1992-93 | 251938 | 162111 | 53971 | 33709 | 501729 |
| 1993-94 | 249554 | 164295 | 57509 | 36022 | 507381 |
| 1994-95 | 264329 | 170413 | 58661 | 38349 | 531752 |
| 1995-96 | 279286 | 182812 | 58798 | 36483 | 557379 |
| 1996-97 | 280495 | 184591 | 64575 | 36847 | 566508 |
| 1997-98 | 283281 | 188019 | 63138 | 36841 | 571278 |
| 1998-99 | 285577 | 193037 | 64033 | 36717 | 579364 |
| 1999-00 | 311609 | 188296 | 72461 | 35407 | 607773 |
| 2000-01 | 324534 | 200719 | 77869 | 35194 | 638315 |
| 2001-02 | 333105 | 207477 | 80809 | 36406 | 657797 |
| 2002-03 | 351155 | 220772 | 86821 | 37519 | 696268 |
| 2003-04 | 384547 | 245714 | 92623 | 38058 | 760941 |
| 2004-05 | 435084 | 282085 | 100330 | 41387 | 858886 |

**Gross Value Added of Transport, Storage and Communication - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 21179 | 17795 | 6483 | 2149 | 47607 |
| 1971-72 | 22935 | 19500 | 6586 | 2442 | 51463 |
| 1972-73 | 25086 | 21160 | 6760 | 2592 | 55598 |
| 1973-74 | 25269 | 21481 | 6815 | 2773 | 56339 |
| 1974-75 | 27312 | 23547 | 7357 | 3302 | 61517 |
| 1975-76 | 30524 | 26772 | 8362 | 3740 | 69398 |
| 1976-77 | 31141 | 29601 | 9629 | 4006 | 74378 |
| 1977-78 | 34161 | 33696 | 11065 | 4537 | 83458 |
| 1978-79 | 37596 | 36968 | 12635 | 5182 | 92381 |
| 1979-80 | 44311 | 38200 | 15388 | 5723 | 103621 |
| 1980-81 | 48014 | 37608 | 17345 | 6703 | 109671 |
| 1981-82 | 47976 | 39434 | 19443 | 8104 | 114958 |
| 1982-83 | 51833 | 42517 | 20951 | 8827 | 124127 |
| 1983-84 | 58724 | 48151 | 23449 | 9930 | 140255 |
| 1984-85 | 63960 | 52573 | 25244 | 11813 | 153590 |
| 1985-86 | 71545 | 56575 | 26645 | 13105 | 167869 |
| 1986-87 | 77618 | 59276 | 28005 | 14155 | 179055 |
| 1987-88 | 86461 | 64049 | 30029 | 15358 | 195897 |
| 1988-89 | 91903 | 68239 | 31599 | 18132 | 209873 |
| 1989-90 | 97128 | 71345 | 33908 | 18748 | 221129 |
| 1990-91 | 106413 | 73681 | 35418 | 19510 | 235022 |
| 1991-92 | 109095 | 76587 | 36137 | 18261 | 240079 |
| 1992-93 | 122109 | 81812 | 39181 | 20853 | 263955 |
| 1993-94 | 132597 | 89358 | 42087 | 21911 | 285953 |
| 1994-95 | 144745 | 94760 | 44183 | 23175 | 306863 |
| 1995-96 | 147423 | 95222 | 46381 | 23424 | 312450 |
| 1996-97 | 158222 | 105924 | 51820 | 24694 | 340661 |
| 1997-98 | 167083 | 112166 | 57554 | 26360 | 363163 |
| 1998-99 | 178723 | 107165 | 57377 | 27867 | 371132 |
| 1999-00 | 192037 | 115061 | 63917 | 29965 | 400981 |
| 2000-01 | 204157 | 123612 | 65511 | 29947 | 423227 |
| 2001-02 | 207362 | 127520 | 65109 | 30510 | 430501 |
| 2002-03 | 224805 | 131370 | 63287 | 29775 | 449236 |
| 2003-04 | 227168 | 137815 | 67477 | 31730 | 464191 |
| 2004-05 | 232820 | 147973 | 69415 | 32366 | 482574 |

**Gross Value Added of Finance and Insurance - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sindh | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 11637 | 21975 | 3320 | 402 | 37334 |
| 1971-72 | 11982 | 22628 | 3419 | 414 | 38443 |
| 1972-73 | 13056 | 24656 | 3725 | 451 | 41889 |
| 1973-74 | 12386 | 23390 | 3534 | 428 | 39737 |
| 1974-75 | 12850 | 24268 | 3667 | 444 | 41229 |
| 1975-76 | 12841 | 24250 | 3664 | 444 | 41199 |
| 1976-77 | 13590 | 25664 | 3878 | 470 | 43602 |
| 1977-78 | 17999 | 33991 | 5136 | 622 | 57748 |
| 1978-79 | 15908 | 30041 | 4539 | 550 | 51038 |
| 1979-80 | 22168 | 41863 | 6325 | 766 | 71122 |
| 1980-81 | 11906 | 31339 | 2648 | 457 | 46351 |
| 1981-82 | 13697 | 36053 | 3047 | 526 | 53322 |
| 1982-83 | 15987 | 42082 | 3556 | 614 | 62239 |
| 1983-84 | 17649 | 46455 | 3926 | 678 | 68708 |
| 1984-85 | 17618 | 46373 | 3919 | 677 | 68586 |
| 1985-86 | 18617 | 48284 | 5293 | 691 | 72885 |
| 1986-87 | 20844 | 54061 | 5926 | 774 | 81605 |
| 1987-88 | 22734 | 58962 | 6464 | 844 | 89004 |
| 1988-89 | 21996 | 57049 | 6254 | 816 | 86116 |
| 1989-90 | 28866 | 62490 | 4834 | 482 | 96672 |
| 1990-91 | 30976 | 67057 | 5187 | 517 | 103737 |
| 1991-92 | 34242 | 74128 | 5735 | 572 | 114676 |
| 1992-93 | 41978 | 90874 | 7030 | 701 | 140582 |
| 1993-94 | 37523 | 81231 | 6284 | 626 | 125664 |
| 1994-95 | 43300 | 93737 | 7251 | 723 | 145012 |
| 1995-96 | 39125 | 84700 | 6552 | 653 | 131030 |
| 1996-97 | 31573 | 68351 | 5288 | 527 | 105739 |
| 1997-98 | 32330 | 69988 | 5414 | 540 | 108272 |
| 1998-99 | 34001 | 73607 | 5694 | 567 | 113869 |
| 1999-00 | 39550 | 85619 | 6623 | 660 | 132453 |
| 2000-01 | 34579 | 73692 | 5623 | 560 | 114455 |
| 2001-02 | 40344 | 85172 | 6589 | 657 | 132761 |
| 2002-03 | 38102 | 82485 | 6381 | 636 | 127604 |
| 2003-04 | 41112 | 91842 | 7104 | 708 | 140766 |
| 2004-05 | 52154 | 119573 | 9250 | 922 | 181899 |

**Gross Value Added of Ownership of Dwelling - Provincial**
(1999-00 prices)

(Rs Million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 14660 | 6831 | 1710 | 1322 | 24523 |
| 1971-72 | 15418 | 7202 | 1823 | 1378 | 25822 |
| 1972-73 | 16216 | 7593 | 1945 | 1437 | 27191 |
| 1973-74 | 17056 | 8006 | 2074 | 1497 | 28632 |
| 1974-75 | 17938 | 8440 | 2212 | 1560 | 30151 |
| 1975-76 | 18866 | 8898 | 2359 | 1626 | 31750 |
| 1976-77 | 19843 | 9382 | 2516 | 1695 | 33435 |
| 1977-78 | 20870 | 9891 | 2683 | 1767 | 35210 |
| 1978-79 | 21950 | 10428 | 2861 | 1841 | 37080 |
| 1979-80 | 23086 | 10994 | 3052 | 1919 | 39050 |
| 1980-81 | 24280 | 11591 | 3255 | 2000 | 41126 |
| 1981-82 | 25537 | 12220 | 3471 | 2084 | 43312 |
| 1982-83 | 26858 | 12884 | 3702 | 2172 | 45616 |
| 1983-84 | 28248 | 13583 | 3948 | 2264 | 48044 |
| 1984-85 | 29710 | 14321 | 4210 | 2360 | 50601 |
| 1985-86 | 31248 | 15098 | 4490 | 2460 | 53296 |
| 1986-87 | 32865 | 15918 | 4789 | 2563 | 56135 |
| 1987-88 | 34565 | 16782 | 5107 | 2672 | 59126 |
| 1988-89 | 36354 | 17693 | 5447 | 2784 | 62279 |
| 1989-90 | 38236 | 18654 | 5809 | 2902 | 65601 |
| 1990-91 | 40214 | 19667 | 6195 | 3025 | 69101 |
| 1991-92 | 42295 | 20734 | 6607 | 3152 | 72789 |
| 1992-93 | 44484 | 21860 | 7047 | 3285 | 76676 |
| 1993-94 | 46786 | 23047 | 7515 | 3424 | 80772 |
| 1994-95 | 49207 | 24298 | 8015 | 3569 | 85089 |
| 1995-96 | 51754 | 25617 | 8548 | 3720 | 89639 |
| 1996-97 | 54432 | 27008 | 9116 | 3877 | 94433 |
| 1997-98 | 57249 | 28474 | 9722 | 4040 | 99486 |
| 1998-99 | 60212 | 30020 | 10369 | 4211 | 104812 |
| 1999-00 | 63328 | 31650 | 11058 | 4389 | 110425 |
| 2000-01 | 66605 | 33369 | 11794 | 4574 | 116341 |
| 2001-02 | 70052 | 35180 | 12578 | 4767 | 122577 |
| 2002-03 | 73677 | 37090 | 13414 | 4969 | 129150 |
| 2003-04 | 77490 | 39104 | 14306 | 5178 | 136078 |
| 2004-05 | 81500 | 41227 | 15257 | 5397 | 143381 |

**Gross Value Added of Public Administration & Defence - Province wise**
(1999-00 prices)

(Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 21200 | 8517 | 5147 | 2427 | 37293 |
| 1971-72 | 22203 | 9321 | 5546 | 2800 | 39870 |
| 1972-73 | 24803 | 10880 | 6370 | 3447 | 45499 |
| 1973-74 | 28822 | 13070 | 7055 | 3283 | 52230 |
| 1974-75 | 38305 | 16991 | 9306 | 4821 | 69423 |
| 1975-76 | 37474 | 16104 | 9518 | 4426 | 67523 |
| 1976-77 | 39186 | 17153 | 11027 | 5165 | 72531 |
| 1977-78 | 47246 | 18411 | 11090 | 4965 | 81712 |
| 1978-79 | 46033 | 20120 | 14225 | 5877 | 86255 |
| 1979-80 | 48253 | 24006 | 14276 | 5173 | 91708 |
| 1980-81 | 55912 | 24252 | 16001 | 5277 | 101442 |
| 1981-82 | 59217 | 23200 | 15298 | 5756 | 103471 |
| 1982-83 | 63417 | 26850 | 16122 | 7216 | 113604 |
| 1983-84 | 66827 | 30293 | 17713 | 7634 | 122467 |
| 1984-85 | 69329 | 32372 | 17496 | 7174 | 126371 |
| 1985-86 | 71968 | 32811 | 18376 | 9986 | 133141 |
| 1986-87 | 75605 | 35425 | 19865 | 9615 | 140510 |
| 1987-88 | 79072 | 36324 | 21409 | 9601 | 146405 |
| 1988-89 | 83728 | 38616 | 24661 | 10615 | 157621 |
| 1989-90 | 85354 | 41621 | 24314 | 10804 | 162093 |
| 1990-91 | 86150 | 44406 | 24403 | 12603 | 167561 |
| 1991-92 | 91345 | 42626 | 25872 | 12106 | 171949 |
| 1992-93 | 94303 | 42057 | 25816 | 14002 | 176178 |
| 1993-94 | 95981 | 44514 | 25477 | 12442 | 178414 |
| 1994-95 | 103036 | 45585 | 24877 | 10419 | 183918 |
| 1995-96 | 112700 | 42388 | 23862 | 10589 | 189539 |
| 1996-97 | 112455 | 42948 | 25961 | 11313 | 192677 |
| 1997-98 | 106419 | 48824 | 30523 | 10988 | 196754 |
| 1998-99 | 113357 | 48448 | 29119 | 10700 | 201623 |
| 1999-00 | 120823 | 54228 | 30796 | 14582 | 220429 |
| 2000-01 | 113324 | 68223 | 30167 | 13493 | 225207 |
| 2001-02 | 119437 | 76288 | 30774 | 13887 | 240386 |
| 2002-03 | 131625 | 77356 | 36779 | 13600 | 259359 |
| 2003-04 | 132861 | 82881 | 37432 | 14253 | 267427 |
| 2004-05 | 130603 | 73611 | 53674 | 10961 | 268849 |

**Gross Value Added of Social, Community & Personal Services**
**Province wise**

(1999-00 prices) (Rs million)

| | Punjab | Sind | NWFP | Balochistan | Pakistan |
|---|---|---|---|---|---|
| 1970-71 | 28222 | 14902 | 8935 | 2362 | 54420 |
| 1971-72 | 29663 | 15664 | 9391 | 2482 | 57201 |
| 1972-73 | 31226 | 16489 | 9886 | 2613 | 60214 |
| 1973-74 | 32932 | 17390 | 10426 | 2756 | 63503 |
| 1974-75 | 34793 | 18372 | 11015 | 2911 | 67092 |
| 1975-76 | 36788 | 19426 | 11647 | 3078 | 70939 |
| 1976-77 | 38080 | 20108 | 12056 | 3187 | 73431 |
| 1977-78 | 41182 | 21746 | 13038 | 3446 | 79413 |
| 1978-79 | 43551 | 22997 | 13788 | 3644 | 83980 |
| 1979-80 | 48816 | 25778 | 15455 | 4085 | 94134 |
| 1980-81 | 49691 | 26239 | 15732 | 4158 | 95820 |
| 1981-82 | 52127 | 27526 | 16503 | 4362 | 100517 |
| 1982-83 | 58986 | 24776 | 16661 | 6608 | 107031 |
| 1983-84 | 63062 | 26487 | 17812 | 7064 | 114425 |
| 1984-85 | 67779 | 28469 | 19144 | 7593 | 122984 |
| 1985-86 | 72518 | 30459 | 20483 | 8123 | 131584 |
| 1986-87 | 78270 | 32875 | 22108 | 8768 | 142021 |
| 1987-88 | 83342 | 35006 | 23540 | 9336 | 151223 |
| 1988-89 | 85986 | 31495 | 32048 | 11438 | 160967 |
| 1989-90 | 90813 | 33263 | 33848 | 12080 | 170004 |
| 1990-91 | 96260 | 35258 | 35878 | 12805 | 180201 |
| 1991-92 | 103685 | 37978 | 38645 | 13793 | 194101 |
| 1992-93 | 110360 | 40422 | 41133 | 14680 | 206595 |
| 1993-94 | 117388 | 42997 | 43752 | 15615 | 219752 |
| 1994-95 | 125269 | 45883 | 46690 | 16664 | 234506 |
| 1995-96 | 131031 | 47994 | 48838 | 17430 | 245293 |
| 1996-97 | 140126 | 51325 | 52228 | 18640 | 262320 |
| 1997-98 | 150141 | 54994 | 55960 | 19972 | 281068 |
| 1998-99 | 160227 | 58688 | 59719 | 21314 | 299947 |
| 1999-00 | 181911 | 78008 | 47093 | 14539 | 321551 |
| 2000-01 | 192816 | 82684 | 49916 | 15410 | 340826 |
| 2001-02 | 206009 | 88342 | 53332 | 16464 | 364147 |
| 2002-03 | 220600 | 94598 | 57109 | 17631 | 389937 |
| 2003-04 | 232020 | 99496 | 60065 | 18543 | 410125 |
| 2004-05 | 245622 | 105329 | 63586 | 19630 | 434167 |

# E Time Series of Capital Stock

**Capital Stock - at Constant Prices of 1999-00 (Beginning of year)**

(Rs million)

| | Agriculture | Mining & Quarrying | Manufacturing | LSM | SSM |
|---|---|---|---|---|---|
| 1970-71 | 176,465 | 17,980 | 337,006 | 301,691 | 38,324 |
| 1971-72 | 179,096 | 18,255 | 338,854 | 302,161 | 39,543 |
| 1972-73 | 183,264 | 18,576 | 337,238 | 298,905 | 40,813 |
| 1973-74 | 188,800 | 19,443 | 331,683 | 291,222 | 42,289 |
| 1974-75 | 192,286 | 19,709 | 325,272 | 282,881 | 43,911 |
| 1975-76 | 193,056 | 20,536 | 324,306 | 280,333 | 45,650 |
| 1976-77 | 209,896 | 20,797 | 334,561 | 290,013 | 46,873 |
| 1977-78 | 227,200 | 23,599 | 350,955 | 305,934 | 48,127 |
| 1978-79 | 245,618 | 26,501 | 372,659 | 327,445 | 49,237 |
| 1979-80 | 261,566 | 27,058 | 393,962 | 348,303 | 50,405 |
| 1980-81 | 279,353 | 27,558 | 412,199 | 365,724 | 51,612 |
| 1981-82 | 299,259 | 29,497 | 423,361 | 375,386 | 53,127 |
| 1982-83 | 321,335 | 31,641 | 436,699 | 386,829 | 55,093 |
| 1983-84 | 351,776 | 32,806 | 455,469 | 403,567 | 57,397 |
| 1984-85 | 388,352 | 37,806 | 480,642 | 426,693 | 59,841 |
| 1985-86 | 427,233 | 43,372 | 501,218 | 444,479 | 62,637 |
| 1986-87 | 460,794 | 54,739 | 526,919 | 467,245 | 65,764 |
| 1987-88 | 498,571 | 69,944 | 550,619 | 487,557 | 69,095 |
| 1988-89 | 532,865 | 78,638 | 573,549 | 506,793 | 72,638 |
| 1989-90 | 560,462 | 90,591 | 601,820 | 531,261 | 76,565 |
| 1990-91 | 590,425 | 95,664 | 637,718 | 563,402 | 80,573 |
| 1991-92 | 620,912 | 102,569 | 679,072 | 601,140 | 84,917 |
| 1992-93 | 644,667 | 112,616 | 750,553 | 667,914 | 91,218 |
| 1993-94 | 673,377 | 120,727 | 823,404 | 734,823 | 98,516 |
| 1994-95 | 705,788 | 132,252 | 890,838 | 794,884 | 106,620 |
| 1995-96 | 739,586 | 150,321 | 906,942 | 802,402 | 113,838 |
| 1996-97 | 772,259 | 167,629 | 934,600 | 820,348 | 122,357 |
| 1997-98 | 778,586 | 197,534 | 968,333 | 844,065 | 131,304 |
| 1998-99 | 789,124 | 216,515 | 996,425 | 859,765 | 141,945 |
| 1999-00 | 815,833 | 233,490 | 1,055,141 | 904,359 | 155,043 |
| 2000-01 | 843,760 | 245,875 | 1,120,852 | 957,064 | 167,879 |
| 2001-02 | 859,591 | 272,340 | 1,184,121 | 1,006,237 | 181,923 |
| 2002-03 | 874,488 | 310,702 | 1,253,781 | 1,060,550 | 197,372 |
| 2003-04 | 890,327 | 369,674 | 1,314,441 | 1,101,978 | 216,797 |
| 2004-05 | 894,261 | 372,667 | 1,408,336 | 1,135,030 | 235,351 |

Continued...

| | Construction | Electricity, Gas & Water Supply | Total Industry | Transport, Storage & Communication | Trade, Hotel & Restaurants |
|---|---|---|---|---|---|
| 1970-71 | 575,719 | 100,668 | 1,031,374 | 142,756 | 48,194 |
| 1971-72 | 576,259 | 109,434 | 1,042,802 | 144,264 | 49,606 |
| 1972-73 | 575,735 | 113,704 | 1,045,253 | 144,952 | 51,042 |
| 1973-74 | 571,960 | 117,496 | 1,040,582 | 150,505 | 52,469 |
| 1974-75 | 567,295 | 122,542 | 1,034,818 | 153,339 | 53,215 |
| 1975-76 | 564,163 | 142,579 | 1,051,584 | 156,797 | 53,343 |
| 1976-77 | 561,352 | 161,751 | 1,078,460 | 156,615 | 53,050 |
| 1977-78 | 551,995 | 173,157 | 1,099,707 | 156,840 | 52,687 |
| 1978-79 | 543,716 | 184,438 | 1,127,313 | 156,232 | 52,301 |
| 1979-80 | 533,184 | 194,620 | 1,148,825 | 154,742 | 51,886 |
| 1980-81 | 523,427 | 198,325 | 1,161,509 | 155,121 | 51,383 |
| 1981-82 | 517,207 | 205,914 | 1,175,980 | 164,913 | 50,935 |
| 1982-83 | 512,734 | 215,770 | 1,196,844 | 177,017 | 50,466 |
| 1983-84 | 512,721 | 234,968 | 1,235,964 | 185,396 | 50,072 |
| 1984-85 | 508,592 | 251,741 | 1,278,781 | 196,315 | 49,810 |
| 1985-86 | 505,240 | 273,882 | 1,323,712 | 214,487 | 49,800 |
| 1986-87 | 501,419 | 294,583 | 1,377,660 | 230,598 | 49,836 |
| 1987-88 | 499,536 | 325,849 | 1,445,947 | 250,688 | 50,038 |
| 1988-89 | 497,875 | 355,055 | 1,505,117 | 262,125 | 50,514 |
| 1989-90 | 495,524 | 401,835 | 1,589,770 | 270,420 | 50,808 |
| 1990-91 | 493,683 | 443,388 | 1,670,454 | 276,356 | 51,231 |
| 1991-92 | 490,763 | 483,419 | 1,755,823 | 292,795 | 52,419 |
| 1992-93 | 492,545 | 532,732 | 1,888,446 | 314,068 | 53,718 |
| 1993-94 | 497,219 | 584,509 | 2,025,859 | 347,569 | 54,937 |
| 1994-95 | 502,971 | 639,156 | 2,165,217 | 364,152 | 56,453 |
| 1995-96 | 506,682 | 723,342 | 2,287,288 | 374,749 | 59,215 |
| 1996-97 | 512,049 | 808,068 | 2,422,347 | 398,922 | 62,960 |
| 1997-98 | 515,596 | 860,084 | 2,541,547 | 441,959 | 65,488 |
| 1998-99 | 519,372 | 918,570 | 2,650,882 | 475,459 | 69,206 |
| 1999-00 | 519,437 | 940,595 | 2,748,664 | 501,171 | 72,785 |
| 2000-01 | 521,569 | 975,028 | 2,863,325 | 543,664 | 77,166 |
| 2001-02 | 520,814 | 1,006,483 | 2,983,758 | 603,912 | 82,642 |
| 2002-03 | 521,142 | 1,024,060 | 3,109,685 | 639,201 | 89,468 |
| 2003-04 | 514,720 | 1,038,336 | 3,237,172 | 665,412 | 97,804 |
| 2004-05 | 509,772 | 1,018,928 | 3,309,703 | 721,357 | 107,897 |

Continued...

| | Finance & Insurance | Ownership of Dwellings | Public Admin & Defence | Other Services | Total Services | Grand Total |
|---|---|---|---|---|---|---|
| 1970-71 | 8,100 | 175,960 | 269,232 | 355,946 | 1,000,188 | 2,208,026 |
| 1971-72 | 8,562 | 177,545 | 273,283 | 362,017 | 1,015,277 | 2,237,175 |
| 1972-73 | 8,798 | 178,954 | 275,669 | 367,832 | 1,027,249 | 2,255,765 |
| 1973-74 | 9,068 | 177,519 | 284,766 | 373,950 | 1,048,277 | 2,277,660 |
| 1974-75 | 9,365 | 175,403 | 303,230 | 392,647 | 1,087,198 | 2,314,302 |
| 1975-76 | 9,577 | 179,682 | 325,685 | 402,036 | 1,127,120 | 2,371,760 |
| 1976-77 | 9,788 | 182,270 | 346,679 | 413,109 | 1,161,510 | 2,449,866 |
| 1977-78 | 10,220 | 186,104 | 369,204 | 430,683 | 1,205,738 | 2,532,644 |
| 1978-79 | 10,759 | 190,903 | 386,085 | 445,070 | 1,241,350 | 2,614,281 |
| 1979-80 | 11,168 | 194,589 | 401,739 | 461,094 | 1,275,218 | 2,685,608 |
| 1980-81 | 11,758 | 198,463 | 411,242 | 497,758 | 1,325,724 | 2,766,586 |
| 1981-82 | 12,219 | 224,096 | 428,586 | 493,451 | 1,374,200 | 2,849,439 |
| 1982-83 | 13,192 | 250,941 | 457,105 | 490,749 | 1,439,471 | 2,957,651 |
| 1983-84 | 14,440 | 278,513 | 486,296 | 488,316 | 1,503,033 | 3,090,773 |
| 1984-85 | 16,014 | 305,579 | 515,327 | 486,826 | 1,569,872 | 3,237,005 |
| 1985-86 | 17,449 | 332,448 | 545,743 | 485,709 | 1,645,636 | 3,396,582 |
| 1986-87 | 19,141 | 358,622 | 578,338 | 487,145 | 1,723,680 | 3,562,134 |
| 1987-88 | 20,847 | 385,616 | 615,602 | 492,198 | 1,814,989 | 3,759,507 |
| 1988-89 | 22,200 | 410,229 | 651,130 | 498,127 | 1,894,325 | 3,932,307 |
| 1989-90 | 22,815 | 432,088 | 680,913 | 499,879 | 1,956,923 | 4,107,155 |
| 1990-91 | 23,453 | 452,491 | 708,516 | 501,265 | 2,013,311 | 4,274,190 |
| 1991-92 | 24,119 | 479,822 | 750,474 | 505,756 | 2,105,385 | 4,482,120 |
| 1992-93 | 24,557 | 510,246 | 798,144 | 512,875 | 2,213,608 | 4,746,721 |
| 1993-94 | 26,309 | 546,128 | 851,773 | 521,067 | 2,347,782 | 5,047,018 |
| 1994-95 | 28,274 | 578,533 | 896,860 | 532,667 | 2,456,938 | 5,327,943 |
| 1995-96 | 33,288 | 604,382 | 936,501 | 542,754 | 2,550,889 | 5,577,763 |
| 1996-97 | 38,859 | 632,185 | 974,623 | 555,820 | 2,663,368 | 5,857,975 |
| 1997-98 | 49,234 | 660,305 | 993,437 | 574,791 | 2,785,215 | 6,105,348 |
| 1998-99 | 55,686 | 692,853 | 1,018,429 | 600,228 | 2,911,861 | 6,351,867 |
| 1999-00 | 64,770 | 728,502 | 1,044,580 | 624,827 | 3,036,635 | 6,601,132 |
| 2000-01 | 72,009 | 768,229 | 1,073,770 | 651,431 | 3,186,269 | 6,893,354 |
| 2001-02 | 73,905 | 812,824 | 1,101,433 | 678,919 | 3,353,634 | 7,196,983 |
| 2002-03 | 80,316 | 852,747 | 1,129,994 | 706,467 | 3,498,192 | 7,482,365 |
| 2003-04 | 98,167 | 891,142 | 1,171,191 | 729,972 | 3,653,688 | 7,781,187 |
| 2004-05 | 116,019 | 931,367 | 1,227,957 | 757,054 | 3,861,652 | 8,065,615 |

# F Factorization of Real GDP Growth (1999-00 prices)

**F.1: Factorization of Growth Rates of GDP**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 3.73 | 0.55 | 0.58 | 2.60 |
| 1972-73 | 6.82 | 0.35 | 2.18 | 4.30 |
| 1973-74 | 5.13 | 0.40 | 1.58 | 3.14 |
| 1974-75 | 2.57 | 0.67 | 1.60 | 0.30 |
| 1975-76 | 2.58 | 1.04 | 2.25 | -0.71 |
| 1976-77 | 3.48 | 1.37 | 2.25 | -0.14 |
| 1977-78 | 7.49 | 1.41 | 2.24 | 3.84 |
| 1978-79 | 5.42 | 1.34 | 2.29 | 1.79 |
| 1979-80 | 8.35 | 1.14 | 1.32 | 5.90 |
| 1980-81 | 4.02 | 1.26 | 1.33 | 1.42 |
| 1981-82 | 6.45 | 1.25 | 1.35 | 3.85 |
| 1982-83 | 6.46 | 1.58 | 1.35 | 3.54 |
| 1983-84 | 3.07 | 1.88 | 1.25 | -0.06 |
| 1984-85 | 8.76 | 1.97 | 1.24 | 5.54 |
| 1985-86 | 5.58 | 2.06 | 0.14 | 3.39 |
| 1986-87 | 4.21 | 2.03 | 4.22 | -2.03 |
| 1987-88 | 5.29 | 2.31 | 1.15 | 1.84 |
| 1988-89 | 4.50 | 1.92 | 4.97 | -2.38 |
| 1989-90 | 3.69 | 1.85 | 4.43 | -2.60 |
| 1990-91 | 4.14 | 1.70 | 0.51 | 1.94 |
| 1991-92 | 5.92 | 2.03 | 2.40 | 1.49 |
| 1992-93 | 3.07 | 2.46 | 1.96 | -1.35 |
| 1993-94 | 2.53 | 2.64 | 2.76 | -2.87 |
| 1994-95 | 5.55 | 2.32 | 1.48 | 1.75 |
| 1995-96 | 2.45 | 1.96 | 2.67 | -2.17 |
| 1996-97 | 1.01 | 2.10 | 4.85 | -5.94 |
| 1997-98 | 3.76 | 1.76 | 3.71 | -1.71 |
| 1998-99 | 3.01 | 1.68 | 2.05 | -0.72 |
| 1999-00 | 5.74 | 1.64 | -1.95 | 6.05 |
| 2000-01 | 2.37 | 1.85 | -0.03 | 0.55 |
| 2001-02 | 3.33 | 1.84 | 0.93 | 0.56 |
| 2002-03 | 4.65 | 1.65 | 3.71 | -0.71 |
| 2003-04 | 7.34 | 1.67 | 4.99 | 0.68 |
| 2004-05 | 8.97 | 1.52 | 3.63 | 3.81 |

Continued …

**F.2: Factorization of Growth Rates of Gross Value Added of Agriculture**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 3.64 | 0.62 | 0.31 | 2.71 |
| 1972-73 | 2.00 | 0.97 | 3.53 | -2.50 |
| 1973-74 | 3.20 | 1.26 | -0.36 | 2.30 |
| 1974-75 | -2.32 | 0.77 | -0.41 | -2.68 |
| 1975-76 | 2.63 | 0.17 | 1.65 | 0.81 |
| 1976-77 | 2.42 | 3.64 | 1.65 | -2.86 |
| 1977-78 | 2.47 | 3.44 | 1.64 | -2.60 |
| 1978-79 | 5.28 | 3.38 | 1.68 | 0.22 |
| 1979-80 | 4.22 | 2.71 | 1.35 | 0.15 |
| 1980-81 | 3.97 | 2.84 | 1.37 | -0.24 |
| 1981-82 | 3.76 | 2.97 | 1.36 | -0.57 |
| 1982-83 | 4.34 | 3.08 | 1.35 | -0.09 |
| 1983-84 | -3.53 | 3.95 | 0.02 | -7.51 |
| 1984-85 | 8.59 | 4.34 | -0.01 | 4.26 |
| 1985-86 | 5.27 | 4.18 | 4.12 | -3.03 |
| 1986-87 | 1.79 | 3.28 | -1.31 | -0.18 |
| 1987-88 | 2.52 | 3.42 | 3.45 | -4.35 |
| 1988-89 | 5.70 | 2.87 | 3.36 | -0.54 |
| 1989-90 | 2.52 | 2.16 | 2.79 | -2.43 |
| 1990-91 | 3.26 | 2.23 | -1.07 | 2.10 |
| 1991-92 | 5.83 | 2.15 | 3.71 | -0.04 |
| 1992-93 | -3.84 | 1.60 | 1.10 | -6.53 |
| 1993-94 | 3.14 | 1.86 | 5.92 | -4.64 |
| 1994-95 | 5.18 | 2.01 | -2.40 | 5.58 |
| 1995-96 | 3.95 | 2.00 | 0.95 | 1.01 |
| 1996-97 | 0.31 | 1.84 | 3.02 | -4.55 |
| 1997-98 | 4.10 | 0.34 | 8.06 | -4.30 |
| 1998-99 | 1.51 | 0.56 | 2.80 | -1.86 |
| 1999-00 | 5.79 | 1.41 | -1.26 | 5.64 |
| 2000-01 | -1.58 | 1.43 | -3.83 | 0.83 |
| 2001-02 | 0.64 | 0.78 | -3.21 | 3.07 |
| 2002-03 | 3.07 | 0.72 | 3.71 | -1.37 |
| 2003-04 | 1.99 | 0.76 | 5.86 | -4.63 |
| 2004-05 | 7.56 | 0.18 | 3.63 | 3.75 |

Continued …

**F.3: Factorization of Growth Rates of Gross Value Added of Industrial Sector**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 0.23 | 0.46 | -7.35 | 7.12 |
| 1972-73 | 10.13 | 0.10 | -7.27 | 17.30 |
| 1973-74 | 7.73 | -0.19 | 10.89 | -2.97 |
| 1974-75 | 1.95 | -0.23 | 9.66 | -7.47 |
| 1975-76 | 4.08 | 0.68 | 3.76 | -0.36 |
| 1976-77 | 3.80 | 1.07 | 3.73 | -0.99 |
| 1977-78 | 8.56 | 0.82 | 3.69 | 4.05 |
| 1978-79 | 4.62 | 1.05 | 3.70 | -0.13 |
| 1979-80 | 9.60 | 0.80 | -7.44 | 16.24 |
| 1980-81 | 8.78 | 0.46 | -8.93 | 17.26 |
| 1981-82 | 10.67 | 0.52 | 11.99 | -1.84 |
| 1982-83 | 6.39 | 0.74 | 10.37 | -4.72 |
| 1983-84 | 4.58 | 1.36 | 2.26 | 0.96 |
| 1984-85 | 11.29 | 1.44 | 2.24 | 7.61 |
| 1985-86 | 5.52 | 1.47 | -2.68 | 6.73 |
| 1986-87 | 3.97 | 1.70 | 10.12 | -7.85 |
| 1987-88 | 7.15 | 2.07 | -4.01 | 9.10 |
| 1988-89 | 2.71 | 1.71 | 5.72 | -4.72 |
| 1989-90 | 3.59 | 2.35 | 5.16 | -3.92 |
| 1990-91 | 4.77 | 2.12 | 1.19 | 1.46 |
| 1991-92 | 5.16 | 2.13 | 1.85 | 1.18 |
| 1992-93 | 3.59 | 3.15 | 1.59 | -1.15 |
| 1993-94 | 2.27 | 3.03 | 1.92 | -2.68 |
| 1994-95 | 4.32 | 2.87 | -0.79 | 2.24 |
| 1995-96 | 0.78 | 2.35 | 3.32 | -4.90 |
| 1996-97 | -1.08 | 2.46 | 5.52 | -9.07 |
| 1997-98 | 3.56 | 2.05 | -2.25 | 3.76 |
| 1998-99 | 4.31 | 1.79 | 3.68 | -1.16 |
| 1999-00 | 2.46 | 1.54 | -0.47 | 1.39 |
| 2000-01 | 3.81 | 1.74 | 4.40 | -2.33 |
| 2001-02 | 2.79 | 1.75 | 5.12 | -4.08 |
| 2002-03 | 4.76 | 1.76 | 3.71 | -0.71 |
| 2003-04 | 14.72 | 1.71 | 3.47 | 9.54 |
| 2004-05 | 10.61 | 0.93 | 3.63 | 6.05 |

Continued …

**F.4: Factorization of Growth Rates of Gross Value Added of Mining & Quarrying**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 1.92 | 0.64 | 43.60 | -42.31 |
| 1972-73 | 1.26 | 0.73 | 72.05 | -71.53 |
| 1973-74 | 2.24 | 1.95 | -23.73 | 24.02 |
| 1974-75 | -0.15 | 0.57 | -42.25 | 41.53 |
| 1975-76 | -1.37 | 1.75 | 1.24 | -4.36 |
| 1976-77 | 27.64 | 0.53 | 1.22 | 25.89 |
| 1977-78 | 4.38 | 5.62 | 1.20 | -2.44 |
| 1978-79 | 1.28 | 5.13 | 1.23 | -5.08 |
| 1979-80 | 5.59 | 0.88 | 56.67 | -51.95 |
| 1980-81 | 10.23 | 0.77 | 30.04 | -20.59 |
| 1981-82 | 8.09 | 2.93 | -21.01 | 26.17 |
| 1982-83 | 10.50 | 3.03 | -34.44 | 41.91 |
| 1983-84 | 2.73 | 1.54 | 22.09 | -20.89 |
| 1984-85 | 30.32 | 6.36 | 16.68 | 7.29 |
| 1985-86 | 29.21 | 6.14 | 31.07 | -8.00 |
| 1986-87 | 4.99 | 10.93 | -3.00 | -2.94 |
| 1987-88 | 9.69 | 11.58 | -19.53 | 17.63 |
| 1988-89 | 2.98 | 5.18 | 4.97 | -7.17 |
| 1989-90 | 11.40 | 6.34 | 4.43 | 0.63 |
| 1990-91 | 14.86 | 2.34 | 0.51 | 12.01 |
| 1991-92 | -1.76 | 3.01 | 42.86 | -47.63 |
| 1992-93 | 1.18 | 4.09 | 28.47 | -31.38 |
| 1993-94 | -0.32 | 3.00 | 2.76 | -6.08 |
| 1994-95 | -1.72 | 3.98 | -38.37 | 32.67 |
| 1995-96 | 5.82 | 5.70 | -2.41 | 2.54 |
| 1996-97 | 2.04 | 4.80 | -0.89 | -1.87 |
| 1997-98 | -0.06 | 7.44 | 59.51 | -67.01 |
| 1998-99 | -1.01 | 4.01 | -17.00 | 11.98 |
| 1999-00 | 4.66 | 3.27 | -27.95 | 29.35 |
| 2000-01 | 0.60 | 2.21 | -0.03 | -1.59 |
| 2001-02 | 5.44 | 4.49 | 0.93 | 0.02 |
| 2002-03 | 15.06 | 5.87 | 3.71 | 5.48 |
| 2003-04 | 4.25 | 7.92 | 4.99 | -8.66 |
| 2004-05 | 5.60 | 0.34 | 3.63 | 1.63 |

Continued …

**F.5: Factorization of Growth Rates of Gross Value Added of Manufacturing**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 1.92 | 0.23 | -9.32 | 11.01 |
| 1972-73 | 9.50 | -0.20 | -18.19 | 27.89 |
| 1973-74 | 7.11 | -0.69 | 20.99 | -13.19 |
| 1974-75 | 1.27 | -0.81 | 16.26 | -14.18 |
| 1975-76 | 2.19 | -0.12 | 3.24 | -0.92 |
| 1976-77 | 2.60 | 1.32 | 3.22 | -1.94 |
| 1977-78 | 8.96 | 2.04 | 3.20 | 3.72 |
| 1978-79 | 4.19 | 2.58 | 3.23 | -1.62 |
| 1979-80 | 9.41 | 2.38 | -9.69 | 16.71 |
| 1980-81 | 10.52 | 1.93 | -12.16 | 20.76 |
| 1981-82 | 11.56 | 1.13 | 15.29 | -4.85 |
| 1982-83 | 7.78 | 1.31 | 12.64 | -6.17 |
| 1983-84 | 3.89 | 1.79 | 1.76 | 0.34 |
| 1984-85 | 11.63 | 2.31 | 1.75 | 7.57 |
| 1985-86 | 3.55 | 1.79 | -2.13 | 3.89 |
| 1986-87 | 2.15 | 2.14 | 8.31 | -8.29 |
| 1987-88 | 6.72 | 1.88 | -7.22 | 12.07 |
| 1988-89 | 1.28 | 1.74 | 5.32 | -5.78 |
| 1989-90 | 2.29 | 2.06 | 4.77 | -4.54 |
| 1990-91 | 2.22 | 2.49 | 0.83 | -1.10 |
| 1991-92 | 5.27 | 2.70 | 2.65 | -0.08 |
| 1992-93 | 3.28 | 4.39 | -2.36 | 1.25 |
| 1993-94 | 2.22 | 4.05 | 3.46 | -5.29 |
| 1994-95 | 3.59 | 3.42 | -4.48 | 4.66 |
| 1995-96 | -1.74 | 0.75 | 4.78 | -7.28 |
| 1996-97 | -1.47 | 1.27 | 6.97 | -9.71 |
| 1997-98 | 3.35 | 1.51 | -2.66 | 4.51 |
| 1998-99 | 3.77 | 1.21 | 6.66 | -4.10 |
| 1999-00 | 2.95 | 2.46 | 2.05 | -1.56 |
| 2000-01 | 8.90 | 2.60 | 5.96 | 0.34 |
| 2001-02 | 4.44 | 2.35 | 6.45 | -4.37 |
| 2002-03 | 6.69 | 2.45 | 3.71 | 0.53 |
| 2003-04 | 13.28 | 2.02 | 4.35 | 6.91 |
| 2004-05 | 11.46 | 2.98 | 3.63 | 4.86 |

Continued …

**F.6: Factorization of Growth Rates of Gross Value Added of Construction**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | -16.35 | 0.04 | -5.46 | -10.93 |
| 1972-73 | 15.75 | -0.04 | 21.86 | -6.08 |
| 1973-74 | 10.89 | -0.27 | -0.54 | 11.70 |
| 1974-75 | 18.04 | -0.34 | -0.60 | 18.97 |
| 1975-76 | 18.23 | -0.23 | 4.84 | 13.62 |
| 1976-77 | -0.48 | -0.21 | 4.74 | -5.00 |
| 1977-78 | 8.48 | -0.70 | 4.63 | 4.54 |
| 1978-79 | 6.54 | -0.63 | 4.59 | 2.58 |
| 1979-80 | 12.33 | -0.81 | -3.11 | 16.24 |
| 1980-81 | -3.37 | -0.76 | -3.44 | 0.84 |
| 1981-82 | 13.67 | -0.50 | 5.69 | 8.47 |
| 1982-83 | -3.50 | -0.36 | 5.39 | -8.53 |
| 1983-84 | 6.15 | 0.00 | 6.21 | -0.06 |
| 1984-85 | 8.72 | -0.34 | 5.82 | 3.23 |
| 1985-86 | 7.00 | -0.27 | -3.62 | 10.89 |
| 1986-87 | 12.11 | -0.32 | 13.40 | -0.97 |
| 1987-88 | 4.61 | -0.16 | 4.80 | -0.03 |
| 1988-89 | 4.94 | -0.14 | 5.76 | -0.69 |
| 1989-90 | -1.44 | -0.20 | 5.21 | -6.45 |
| 1990-91 | 10.21 | -0.15 | 1.23 | 9.14 |
| 1991-92 | 5.22 | -0.25 | -0.26 | 5.73 |
| 1992-93 | 4.37 | 0.15 | 7.67 | -3.45 |
| 1993-94 | 1.90 | 0.40 | -1.03 | 2.53 |
| 1994-95 | 0.83 | 0.48 | 8.01 | -7.66 |
| 1995-96 | 3.95 | 0.31 | 0.72 | 2.92 |
| 1996-97 | 0.82 | 0.44 | 2.77 | -2.39 |
| 1997-98 | 1.08 | 0.29 | -0.79 | 1.59 |
| 1998-99 | -4.86 | 0.31 | -0.26 | -4.91 |
| 1999-00 | 5.18 | 0.01 | -4.19 | 9.36 |
| 2000-01 | 0.73 | 0.17 | 1.34 | -0.77 |
| 2001-02 | 2.04 | -0.06 | 2.29 | -0.19 |
| 2002-03 | 4.06 | 0.03 | 3.71 | 0.33 |
| 2003-04 | -11.59 | -0.51 | 2.69 | -13.76 |
| 2004-05 | 19.77 | -0.40 | 3.63 | 16.55 |

Continued …

**F.7: Factorization of Growth Rates of Gross Value Added of Electricity, Gas & Water Supply**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 4.39 | 3.63 | 28.84 | -28.08 |
| 1972-73 | 14.58 | 1.63 | -4.36 | 17.32 |
| 1973-74 | 12.37 | 1.39 | 16.10 | -5.12 |
| 1974-75 | -7.66 | 1.79 | 13.29 | -22.74 |
| 1975-76 | 5.55 | 6.82 | 9.97 | -11.24 |
| 1976-77 | 11.05 | 5.61 | 9.10 | -3.65 |
| 1977-78 | 7.27 | 2.94 | 8.40 | -4.07 |
| 1978-79 | 7.16 | 2.72 | 7.88 | -3.44 |
| 1979-80 | 9.23 | 2.30 | -4.32 | 11.25 |
| 1980-81 | 10.29 | 0.79 | -4.89 | 14.39 |
| 1981-82 | 0.96 | 1.60 | 27.70 | -28.33 |
| 1982-83 | 5.16 | 2.00 | 19.62 | -16.45 |
| 1983-84 | 9.86 | 3.71 | -10.34 | 16.49 |
| 1984-85 | 3.14 | 2.98 | -13.15 | 13.31 |
| 1985-86 | 9.34 | 3.67 | -14.26 | 19.93 |
| 1986-87 | 9.75 | 3.15 | 29.46 | -22.86 |
| 1987-88 | 12.30 | 4.43 | -10.25 | 18.13 |
| 1988-89 | 11.29 | 3.74 | 13.55 | -6.00 |
| 1989-90 | 14.00 | 5.49 | 11.92 | -3.41 |
| 1990-91 | 10.61 | 4.31 | 6.78 | -0.48 |
| 1991-92 | 8.36 | 3.77 | -0.53 | 5.12 |
| 1992-93 | 5.91 | 4.25 | 5.77 | -4.12 |
| 1993-94 | 4.19 | 4.05 | 4.94 | -4.81 |
| 1994-95 | 14.23 | 3.90 | -1.96 | 12.29 |
| 1995-96 | 8.94 | 5.49 | 8.61 | -5.16 |
| 1996-97 | -1.92 | 4.89 | 10.46 | -17.27 |
| 1997-98 | 7.83 | 2.68 | -14.01 | 19.15 |
| 1998-99 | 15.17 | 2.84 | 2.05 | 10.28 |
| 1999-00 | -1.77 | 1.00 | -1.95 | -0.83 |
| 2000-01 | -14.08 | 1.53 | 4.55 | -20.16 |
| 2001-02 | -6.34 | 1.35 | 5.25 | -12.93 |
| 2002-03 | -10.62 | 0.73 | 3.71 | -15.06 |
| 2003-04 | 55.36 | 0.58 | -5.95 | 60.72 |
| 2004-05 | 3.42 | -0.78 | 3.63 | 0.58 |

Continued …

**F.8: Factorization of Growth Rates of Gross Value Added of Services Sector**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 5.81 | 0.63 | 7.86 | -2.68 |
| 1972-73 | 9.83 | 0.49 | 5.27 | 4.07 |
| 1973-74 | 5.51 | 0.85 | 0.95 | 3.71 |
| 1974-75 | 7.33 | 1.55 | 0.96 | 4.82 |
| 1975-76 | 1.74 | 1.53 | 2.42 | -2.21 |
| 1976-77 | 4.19 | 1.27 | 2.42 | 0.50 |
| 1977-78 | 11.01 | 1.59 | 2.41 | 7.01 |
| 1978-79 | 5.95 | 1.23 | 2.46 | 2.26 |
| 1979-80 | 10.81 | 1.14 | 7.82 | 1.85 |
| 1980-81 | 1.62 | 1.65 | 7.20 | -7.23 |
| 1981-82 | 6.09 | 1.53 | -3.29 | 7.86 |
| 1982-83 | 8.00 | 1.98 | -3.69 | 9.71 |
| 1983-84 | 6.71 | 1.84 | 2.86 | 2.00 |
| 1984-85 | 7.46 | 1.85 | 2.82 | 2.79 |
| 1985-86 | 5.82 | 2.01 | -4.81 | 8.62 |
| 1986-87 | 5.85 | 1.98 | 11.11 | -7.24 |
| 1987-88 | 5.90 | 2.21 | 0.97 | 2.73 |
| 1988-89 | 4.83 | 1.82 | 7.26 | -4.25 |
| 1989-90 | 4.41 | 1.38 | 6.62 | -3.58 |
| 1990-91 | 4.29 | 1.20 | 2.49 | 0.60 |
| 1991-92 | 6.39 | 1.91 | 0.85 | 3.64 |
| 1992-93 | 6.65 | 2.14 | 3.48 | 1.03 |
| 1993-94 | 2.36 | 2.53 | -1.30 | 1.13 |
| 1994-95 | 6.38 | 1.94 | 9.23 | -4.79 |
| 1995-96 | 2.57 | 1.59 | 4.63 | -3.66 |
| 1996-97 | 2.43 | 1.84 | 6.83 | -6.24 |
| 1997-98 | 3.69 | 1.91 | 1.56 | 0.23 |
| 1998-99 | 3.13 | 1.90 | 0.28 | 0.95 |
| 1999-00 | 7.35 | 1.79 | -3.65 | 9.21 |
| 2000-01 | 3.61 | 2.06 | 3.09 | -1.54 |
| 2001-02 | 4.83 | 2.19 | 3.94 | -1.30 |
| 2002-03 | 5.31 | 1.80 | 3.71 | -0.20 |
| 2003-04 | 6.24 | 1.85 | 4.86 | -0.47 |
| 2004-05 | 8.73 | 2.37 | 3.63 | 2.73 |

Continued …

**F.9: Factorization of Growth Rates of Gross Value Added of Trade, Hotels & Restaurants**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 5.85 | 1.22 | -0.02 | 4.65 |
| 1972-73 | 11.74 | 1.21 | -2.10 | 12.64 |
| 1973-74 | 6.87 | 1.17 | 6.95 | -1.25 |
| 1974-75 | 1.88 | 0.59 | 6.53 | -5.24 |
| 1975-76 | -1.41 | 0.10 | 2.45 | -3.97 |
| 1976-77 | 1.91 | -0.23 | 2.45 | -0.32 |
| 1977-78 | 7.54 | -0.29 | 2.45 | 5.38 |
| 1978-79 | 8.95 | -0.31 | 2.49 | 6.76 |
| 1979-80 | 6.41 | -0.33 | -4.98 | 11.71 |
| 1980-81 | 6.03 | -0.40 | -5.70 | 12.13 |
| 1981-82 | 7.09 | -0.36 | 9.33 | -1.87 |
| 1982-83 | 6.75 | -0.38 | 8.38 | -1.25 |
| 1983-84 | 3.32 | -0.33 | 0.25 | 3.40 |
| 1984-85 | 10.05 | -0.22 | 0.23 | 10.04 |
| 1985-86 | 4.12 | -0.01 | -0.57 | 4.70 |
| 1986-87 | 3.79 | 0.03 | 7.78 | -4.02 |
| 1987-88 | 4.15 | 0.17 | 0.50 | 3.48 |
| 1988-89 | 3.81 | 0.40 | 7.31 | -3.89 |
| 1989-90 | 2.36 | 0.24 | 6.66 | -4.54 |
| 1990-91 | 2.15 | 0.35 | 2.53 | -0.73 |
| 1991-92 | 8.70 | 0.97 | 1.76 | 5.97 |
| 1992-93 | 3.04 | 1.03 | 2.97 | -0.96 |
| 1993-94 | 1.13 | 0.95 | 0.29 | -0.11 |
| 1994-95 | 4.80 | 1.15 | 9.52 | -5.87 |
| 1995-96 | 4.82 | 2.04 | 2.92 | -0.14 |
| 1996-97 | 1.64 | 2.64 | 5.11 | -6.11 |
| 1997-98 | 0.84 | 1.67 | 0.53 | -1.36 |
| 1998-99 | 1.42 | 2.37 | 1.25 | -2.20 |
| 1999-00 | 4.90 | 2.16 | -2.71 | 5.45 |
| 2000-01 | 5.03 | 2.51 | 2.89 | -0.37 |
| 2001-02 | 3.05 | 2.96 | 3.75 | -3.66 |
| 2002-03 | 5.85 | 3.44 | 3.71 | -1.31 |
| 2003-04 | 9.29 | 3.89 | 4.78 | 0.62 |
| 2004-05 | 12.87 | 4.30 | 3.63 | 4.94 |

Continued …

**F.10: Factorization of Growth Rates of Gross Value Added of Transport, Storage and Communication**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 8.10 | 0.44 | 0.10 | 7.56 |
| 1972-73 | 8.04 | 0.20 | -9.32 | 17.16 |
| 1973-74 | 1.33 | 1.60 | 8.84 | -9.10 |
| 1974-75 | 9.19 | 0.79 | 8.07 | 0.33 |
| 1975-76 | 12.81 | 0.94 | 1.81 | 10.06 |
| 1976-77 | 7.18 | -0.05 | 1.81 | 5.42 |
| 1977-78 | 12.21 | 0.06 | 1.80 | 10.34 |
| 1978-79 | 10.69 | -0.16 | 1.84 | 9.01 |
| 1979-80 | 12.17 | -0.40 | -2.40 | 14.97 |
| 1980-81 | 5.84 | 0.10 | -2.63 | 8.37 |
| 1981-82 | 4.82 | 2.63 | 4.59 | -2.41 |
| 1982-83 | 7.98 | 3.06 | 4.42 | 0.50 |
| 1983-84 | 12.99 | 1.97 | 5.20 | 5.81 |
| 1984-85 | 9.51 | 2.46 | 4.95 | 2.10 |
| 1985-86 | 9.30 | 3.86 | -8.63 | 14.06 |
| 1986-87 | 6.66 | 3.13 | 15.95 | -12.42 |
| 1987-88 | 9.41 | 3.63 | -2.93 | 8.70 |
| 1988-89 | 7.13 | 1.90 | 6.48 | -1.25 |
| 1989-90 | 5.36 | 1.32 | 5.89 | -1.85 |
| 1990-91 | 6.28 | 0.92 | 1.85 | 3.52 |
| 1991-92 | 2.15 | 2.48 | 5.53 | -5.85 |
| 1992-93 | 9.94 | 3.03 | 2.07 | 4.85 |
| 1993-94 | 8.33 | 4.45 | -3.54 | 7.43 |
| 1994-95 | 7.31 | 1.99 | 2.93 | 2.40 |
| 1995-96 | 1.82 | 1.21 | 6.51 | -5.91 |
| 1996-97 | 9.03 | 2.69 | 8.60 | -2.26 |
| 1997-98 | 6.61 | 4.50 | 1.21 | 0.90 |
| 1998-99 | 2.19 | 3.16 | -0.42 | -0.54 |
| 1999-00 | 8.04 | 2.26 | -4.36 | 10.15 |
| 2000-01 | 5.55 | 3.54 | 5.01 | -3.00 |
| 2001-02 | 1.72 | 4.62 | 5.65 | -8.55 |
| 2002-03 | 4.35 | 2.44 | 3.71 | -1.80 |
| 2003-04 | 3.33 | 1.71 | 2.85 | -1.23 |
| 2004-05 | 3.96 | 3.51 | 3.63 | -3.17 |

Continued …

**F.11: Factorization of Growth Rates of Gross Value Added of Finance & Insurance**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 2.97 | 2.38 | 0.58 | 0.02 |
| 1972-73 | 8.96 | 1.15 | 2.18 | 5.64 |
| 1973-74 | -5.14 | 1.28 | 1.58 | -8.00 |
| 1974-75 | 3.75 | 1.36 | 1.60 | 0.79 |
| 1975-76 | -0.07 | 0.95 | 2.25 | -3.27 |
| 1976-77 | 5.83 | 0.92 | 2.25 | 2.67 |
| 1977-78 | 32.44 | 1.84 | 2.24 | 28.36 |
| 1978-79 | -11.62 | 2.20 | 2.29 | -16.11 |
| 1979-80 | 39.35 | 1.58 | 1.32 | 36.45 |
| 1980-81 | -34.83 | 2.20 | 1.33 | -38.37 |
| 1981-82 | 15.04 | 1.64 | 3.71 | 9.70 |
| 1982-83 | 16.72 | 3.32 | 3.61 | 9.79 |
| 1983-84 | 10.39 | 3.95 | 3.43 | 3.02 |
| 1984-85 | -0.18 | 4.54 | 3.35 | -8.07 |
| 1985-86 | 6.27 | 3.74 | 4.12 | -1.59 |
| 1986-87 | 11.97 | 4.04 | -7.09 | 15.01 |
| 1987-88 | 9.07 | 3.72 | -3.49 | 8.83 |
| 1988-89 | -3.24 | 2.71 | 10.32 | -16.27 |
| 1989-90 | 12.26 | 1.16 | 9.32 | 1.79 |
| 1990-91 | 7.31 | 1.17 | 4.76 | 1.39 |
| 1991-92 | 10.55 | 1.18 | -6.47 | 15.83 |
| 1992-93 | 22.59 | 0.76 | 6.72 | 15.12 |
| 1993-94 | -10.61 | 2.98 | -0.22 | -13.37 |
| 1994-95 | 15.40 | 3.11 | 0.71 | 11.57 |
| 1995-96 | -9.64 | 7.40 | 10.98 | -28.02 |
| 1996-97 | -19.30 | 6.98 | 12.43 | -38.71 |
| 1997-98 | 2.40 | 11.14 | -3.25 | -5.49 |
| 1998-99 | 5.17 | 5.47 | 0.32 | -0.61 |
| 1999-00 | 16.32 | 6.80 | -3.61 | 13.13 |
| 2000-01 | -13.59 | 4.66 | 2.46 | -20.71 |
| 2001-02 | 15.99 | 1.10 | 3.36 | 11.54 |
| 2002-03 | -3.88 | 3.62 | 3.71 | -11.21 |
| 2003-04 | 10.31 | 9.27 | 17.08 | -16.04 |
| 2004-05 | 29.22 | 7.58 | 3.63 | 18.01 |

Continued …

**F.12: Factorization of Growth Rates of Gross Value Added of Ownership of Dwelling**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 5.30 | 0.38 | 22.17 | -17.25 |
| 1972-73 | 5.30 | 0.33 | 19.39 | -14.43 |
| 1973-74 | 5.30 | -0.33 | 1.26 | 4.37 |
| 1974-75 | 5.30 | -0.50 | -16.26 | 22.06 |
| 1975-76 | 5.31 | 1.02 | 2.09 | 2.20 |
| 1976-77 | 5.31 | 0.60 | 1.95 | 2.76 |
| 1977-78 | 5.31 | 0.88 | 1.64 | 2.79 |
| 1978-79 | 5.31 | 1.08 | 2.59 | 1.64 |
| 1979-80 | 5.31 | 0.81 | 30.67 | -26.17 |
| 1980-81 | 5.32 | 0.83 | 7.99 | -3.51 |
| 1981-82 | 5.32 | 5.39 | -13.04 | 12.98 |
| 1982-83 | 5.32 | 5.00 | -6.68 | 7.00 |
| 1983-84 | 5.32 | 4.58 | 1.25 | -0.51 |
| 1984-85 | 5.32 | 4.05 | 16.05 | -14.78 |
| 1985-86 | 5.33 | 3.67 | -5.78 | 7.44 |
| 1986-87 | 5.33 | 3.28 | 16.86 | -14.81 |
| 1987-88 | 5.33 | 3.14 | 1.51 | 0.68 |
| 1988-89 | 5.33 | 2.66 | 5.35 | -2.68 |
| 1989-90 | 5.33 | 2.22 | 4.43 | -1.32 |
| 1990-91 | 5.34 | 1.97 | 13.06 | -9.70 |
| 1991-92 | 5.34 | 2.52 | 0.51 | 2.31 |
| 1992-93 | 5.34 | 2.64 | 9.02 | -6.33 |
| 1993-94 | 5.34 | 2.93 | 3.51 | -1.10 |
| 1994-95 | 5.34 | 2.47 | 3.86 | -0.99 |
| 1995-96 | 5.35 | 1.86 | 2.67 | 0.82 |
| 1996-97 | 5.35 | 1.92 | 11.44 | -8.01 |
| 1997-98 | 5.35 | 1.86 | 3.71 | -0.21 |
| 1998-99 | 5.35 | 2.06 | 2.05 | 1.24 |
| 1999-00 | 5.36 | 2.15 | -5.05 | 8.26 |
| 2000-01 | 5.36 | 2.27 | 8.75 | -5.67 |
| 2001-02 | 5.36 | 2.42 | -0.33 | 3.26 |
| 2002-03 | 5.36 | 2.05 | 4.43 | -1.12 |
| 2003-04 | 5.36 | 1.88 | 5.40 | -1.91 |
| 2004-05 | 5.37 | 1.88 | 3.67 | -0.18 |

Continued …

**F.13: Factorization of Growth Rates of Gross Value Added of Public Administration & Defence**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 6.91 | 0.63 | 22.65 | -16.37 |
| 1972-73 | 14.12 | 0.36 | 19.46 | -5.70 |
| 1973-74 | 14.79 | 1.38 | -4.06 | 17.48 |
| 1974-75 | 32.92 | 2.70 | -6.49 | 36.70 |
| 1975-76 | -2.74 | 3.09 | 3.54 | -9.37 |
| 1976-77 | 7.42 | 2.69 | 3.59 | 1.13 |
| 1977-78 | 12.66 | 2.71 | 3.73 | 6.22 |
| 1978-79 | 5.56 | 1.91 | 3.58 | 0.07 |
| 1979-80 | 6.32 | 1.69 | 13.11 | -8.48 |
| 1980-81 | 10.61 | 0.99 | 31.19 | -21.56 |
| 1981-82 | 2.00 | 1.76 | -6.51 | 6.75 |
| 1982-83 | 9.79 | 2.78 | -18.65 | 25.67 |
| 1983-84 | 7.80 | 2.66 | 1.25 | 3.89 |
| 1984-85 | 3.19 | 2.49 | 10.53 | -9.83 |
| 1985-86 | 5.36 | 2.46 | -7.18 | 10.07 |
| 1986-87 | 5.54 | 2.49 | 15.53 | -12.49 |
| 1987-88 | 4.20 | 2.69 | 0.91 | 0.60 |
| 1988-89 | 7.66 | 2.41 | 10.82 | -5.57 |
| 1989-90 | 2.84 | 1.91 | 9.96 | -9.03 |
| 1990-91 | 3.37 | 1.69 | 0.94 | 0.74 |
| 1991-92 | 2.62 | 2.47 | 0.44 | -0.29 |
| 1992-93 | 2.46 | 2.65 | 9.03 | -9.22 |
| 1993-94 | 1.27 | 2.80 | 3.33 | -4.86 |
| 1994-95 | 3.08 | 2.21 | 3.49 | -2.61 |
| 1995-96 | 3.06 | 1.84 | 8.71 | -7.49 |
| 1996-97 | 1.66 | 1.70 | 4.81 | -4.85 |
| 1997-98 | 2.12 | 0.81 | 2.21 | -0.90 |
| 1998-99 | 2.47 | 1.05 | -3.31 | 4.73 |
| 1999-00 | 9.33 | 1.07 | -2.61 | 10.86 |
| 2000-01 | 2.17 | 1.17 | -0.03 | 1.03 |
| 2001-02 | 6.74 | 1.07 | 4.74 | 0.92 |
| 2002-03 | 7.89 | 1.08 | 3.05 | 3.76 |
| 2003-04 | 3.11 | 1.52 | 4.88 | -3.29 |
| 2004-05 | 0.53 | 2.02 | 3.87 | -5.36 |

Continued …

**F.14: Factorization of Growth Rates of Gross Value Added of Other Services**

| | Output Growth | Contribution of Capital | Contribution of Labour | TFP |
|---|---|---|---|---|
| 1971-72 | 5.11 | 0.71 | 35.83 | -31.43 |
| 1972-73 | 5.27 | 0.67 | 23.53 | -18.93 |
| 1973-74 | 5.46 | 0.69 | -12.39 | 17.16 |
| 1974-75 | 5.65 | 2.09 | -2.07 | 5.64 |
| 1975-76 | 5.73 | 1.00 | 2.25 | 2.49 |
| 1976-77 | 3.51 | 1.15 | 2.25 | 0.12 |
| 1977-78 | 8.15 | 1.77 | 2.24 | 4.13 |
| 1978-79 | 5.75 | 1.39 | 1.96 | 2.40 |
| 1979-80 | 12.09 | 1.50 | 45.15 | -34.56 |
| 1980-81 | 1.79 | 3.32 | 18.44 | -19.96 |
| 1981-82 | 4.90 | -0.36 | -15.51 | 20.77 |
| 1982-83 | 6.48 | -0.23 | -15.83 | 22.54 |
| 1983-84 | 6.91 | -0.21 | 9.89 | -2.77 |
| 1984-85 | 7.48 | -0.13 | -5.41 | 13.01 |
| 1985-86 | 6.99 | -0.10 | -10.16 | 17.25 |
| 1986-87 | 7.93 | 0.12 | 11.60 | -3.79 |
| 1987-88 | 6.48 | 0.43 | 7.99 | -1.94 |
| 1988-89 | 6.44 | 0.50 | 4.97 | 0.97 |
| 1989-90 | 5.61 | 0.15 | 4.43 | 1.04 |
| 1990-91 | 6.00 | 0.12 | -2.44 | 8.32 |
| 1991-92 | 7.71 | 0.37 | -5.39 | 12.73 |
| 1992-93 | 6.44 | 0.59 | -6.80 | 12.65 |
| 1993-94 | 6.37 | 0.67 | -19.37 | 25.07 |
| 1994-95 | 6.71 | 0.93 | 54.42 | -48.63 |
| 1995-96 | 4.60 | 0.79 | 2.67 | 1.14 |
| 1996-97 | 6.94 | 1.00 | 8.31 | -2.37 |
| 1997-98 | 7.15 | 1.42 | 3.40 | 2.32 |
| 1998-99 | 6.72 | 1.85 | 2.05 | 2.82 |
| 1999-00 | 7.20 | 1.71 | -5.97 | 11.46 |
| 2000-01 | 5.99 | 1.78 | -0.03 | 4.24 |
| 2001-02 | 6.84 | 1.76 | 6.66 | -1.58 |
| 2002-03 | 7.08 | 1.69 | 3.92 | 1.47 |
| 2003-04 | 5.18 | 1.39 | 4.68 | -0.89 |
| 2004-05 | 5.86 | 1.55 | 3.19 | 1.12 |